



# I- 81 IMPROVEMENT PROJECT

## 2016 INITIAL FINANCIAL PLAN



U.S. Department of Transportation  
**Federal Highway Administration**

**SUBMITTED: JUNE 24, 2016**

*Reporting period as of March 15, 2016.*



U.S. Department  
of Transportation  
**Federal Highway  
Administration**

**Maryland Division**

July 19, 2016

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In Reply Refer To:  
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Mr. Gregory C. Johnson, P.E.  
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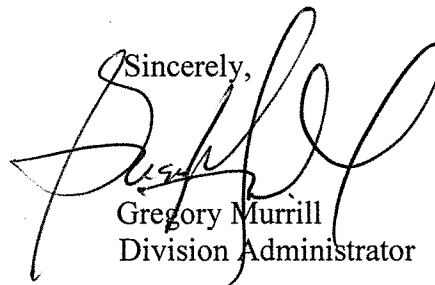
Dear Mr. Johnson:

Thank you for submitting the I-81 Improvement Project's Initial Financial Plan (IFP) dated June 24, 2016. We are of the opinion that the Plan submitted provides a comprehensive update of the cost, as well as the financial resources needed to complete the project. We hereby acknowledge that the Financial Plan meets the requirements outlined in FHWA's Financial Plan Guidance dated December 18, 2014.

The total estimated cost to complete the project is \$811.1 million in the year of expenditure. The estimated construction completion date for this project is June 2034. The current funded phases (1 and 1A) cost, as stated in the IFP, is \$125.2 million with an estimated construction completion in June 2019.

We appreciate the work your staff has done in developing this comprehensive Financial Plan and look forward to continuing our partnership in completing this important transportation improvement project. Please note that the first annual update should be as of December 1, 2016 and should be submitted to FHWA within 90 days (approximately March 1, 2017).

Should you have any questions, please contact Daniel Suarez at 410-779-7159 or [daniel.suarez@dot.gov](mailto:daniel.suarez@dot.gov).

Sincerely,  
  
Gregory Murrill  
Division Administrator

cc:

Barrett Kiedrowski – MDOT/SHA

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Guy Talerico – MDOT/SHA



**MARYLAND DEPARTMENT OF TRANSPORTATION  
STATE HIGHWAY ADMINISTRATION**

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**I-81 CORRIDOR IMPROVEMENT PROJECT**  
Between West Virginia State Line and Pennsylvania State Line

**INITIAL FINANCIAL PLAN  
LETTER OF CERTIFICATION**

The Maryland State Highway Administration has developed a comprehensive Initial Financial Plan for the I-81 Improvement Project in accordance with the requirements of title 23, United States Code, section 106 and the Financial Plan guidance issued by the Federal Highway Administration. The plan provides detailed cost estimates to complete the project and the estimates of financial resources to be utilized to fully fund the project.

The cost data in the Financial Plan provide an accurate accounting of costs incurred to date and include a realistic estimate of future costs based on engineer's estimates and expected construction cost escalation factors. While the estimates of financial resources rely upon assumptions regarding future economic conditions and demographic variables, they represent realistic estimates of resources available to fund the project as described.

The Maryland State Highway Administration believes the Financial Plan provides an accurate basis upon which to schedule and fund the I-81 Improvement Project, and commits to provide Annual Updates according to the schedule outlined in the Initial Financial Plan.

To the best of our knowledge and belief, the Financial Plan as submitted herewith, fairly and accurately presents the financial position of I-81 Improvement project, cash flows, and expected conditions for the project's life cycle. The financial forecasts in the Financial Plan are based on our judgment of the expected project conditions and our expected course of action. We believe that the assumptions underlying the Financial Plan are reasonable and appropriate. Further, we have made available all significant information that we believe is relevant to the Financial Plan and, to the best of our knowledge and belief, the documents and records supporting the assumptions are appropriate.

Respectfully Submitted:

A handwritten signature in blue ink, appearing to read "Gregory C. Johnson", followed by the date "6/30/14".

Gregory C. Johnson  
Administrator  
Maryland State Highway Administration

Date

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## **EXECUTIVE SUMMARY**

The Maryland Department of Transportation - State Highway Administration (MDSHA) began a project planning Study of I-81 located in Washington County in July 2001. The study area extends 12 miles from the West Virginia state line to just south of the Pennsylvania state line. The Federal Highway Administration (FHWA) granted location approval to MDSHA for this project on February 25, 2010.

The State's Consolidated Transportation Program (CTP) for 2016-2021 lists the I-81 Improvement Project. FHWA Model forecast 70% probabilistic total project estimated cost for funded and unfunded breakout phases is \$811.1 million. Since only the funded breakout phases at this time have gone through detailed engineering, the MDSHA has decided to use the 70% probabilistic estimate for the funded phases, and use a range of 20% to 80% probabilistic estimates for the unfunded phases. This approach has led to a total estimated project cost of \$754 - \$823 million.

The funded portion of the project has an estimated project cost of \$125.2 million, out of which \$3.8 million has been already spent (see table 10 page 28). The remaining portion of the funded breakouts will therefore need additional \$121.4 million (see table 11 page 29). The unfunded portion of the project has an estimated project cost of \$629 - \$698 million.

Given that federal allocations will be a significant source of funding for the project, and the total cost of the project exceeds \$500 million, federal law requires the project sponsoring agencies to submit a detailed financial plan defining the methodology in which the project will be delivered. The MDSHA has developed a financial plan that incorporates a combination of state and federal sources to partially fund the project. At this time, MDSHA has been able to fund only two breakout phases, while the remaining breakouts remain unfunded.

This document serves as the I-81 Improvement Project's Initial Financial Plan and is structured to meet the requirements outlined by the FHWA. This plan includes the following topics in order to meet the FHWA requirements:

### **Section 1 – Project Description**

This section presents the project scope, map, environmental approvals, sequence and phasing plan.

### **Section 2 – Project Completion Schedule**

This section discusses the current project milestones and estimated completion dates.

### **Section 3 - Project Cost**

This section identifies the key cost components and estimating methodology for the \$754 - \$823 million project.

### **Section 4 - Project Funds**

This section identifies committed funding for the remaining portion (estimated \$121.4 million) of the funded phases from the following sources:

- Transportation Trust Fund sources totaling \$23.5 million
- Federal Funds totaling \$97.9 million

**Section 5 – Financing Issues**

This section discusses how any anticipated financing issues will be addressed for this project.

**Section 6 - Project Cash Flow**

This section summarizes anticipated funding account balances on an annual basis and concludes sufficient funds will be in place to meet capital expenditure requirements.

**Section 7 – Public-Private Partnership (P3) Assessment**

This section includes an overview of current P3 legislation and future opportunities to utilize P3 funding for the unfunded phases.

**Section 8 – Risk and Response Strategies**

This section includes cost containment strategies, responsibilities of the MDSHA, as well as related agreements and issues pertaining to the project financing requirements.

**Section 9 – Annual Update Cycle**

This section discusses the schedule of annual updates to this Phased Financial Plan.

This Initial Financial Plan covers all revenues and expenditures realized since 2001, including prior project planning activities. Through the presentation of this Initial Financial Plan, the sponsoring agencies believe that the I-81 Improvement Project team has developed the necessary financial and project structures to complete the project on budget and on schedule.

## SECTION 1 – INTRODUCTION

### PROJECT DESCRIPTION

The I-81 Improvement Project will improve traffic operations and safety along I-81 corridor from the West Virginia state line to the Pennsylvania state line, a distance of approximately 12 miles in the Washington County, Maryland.

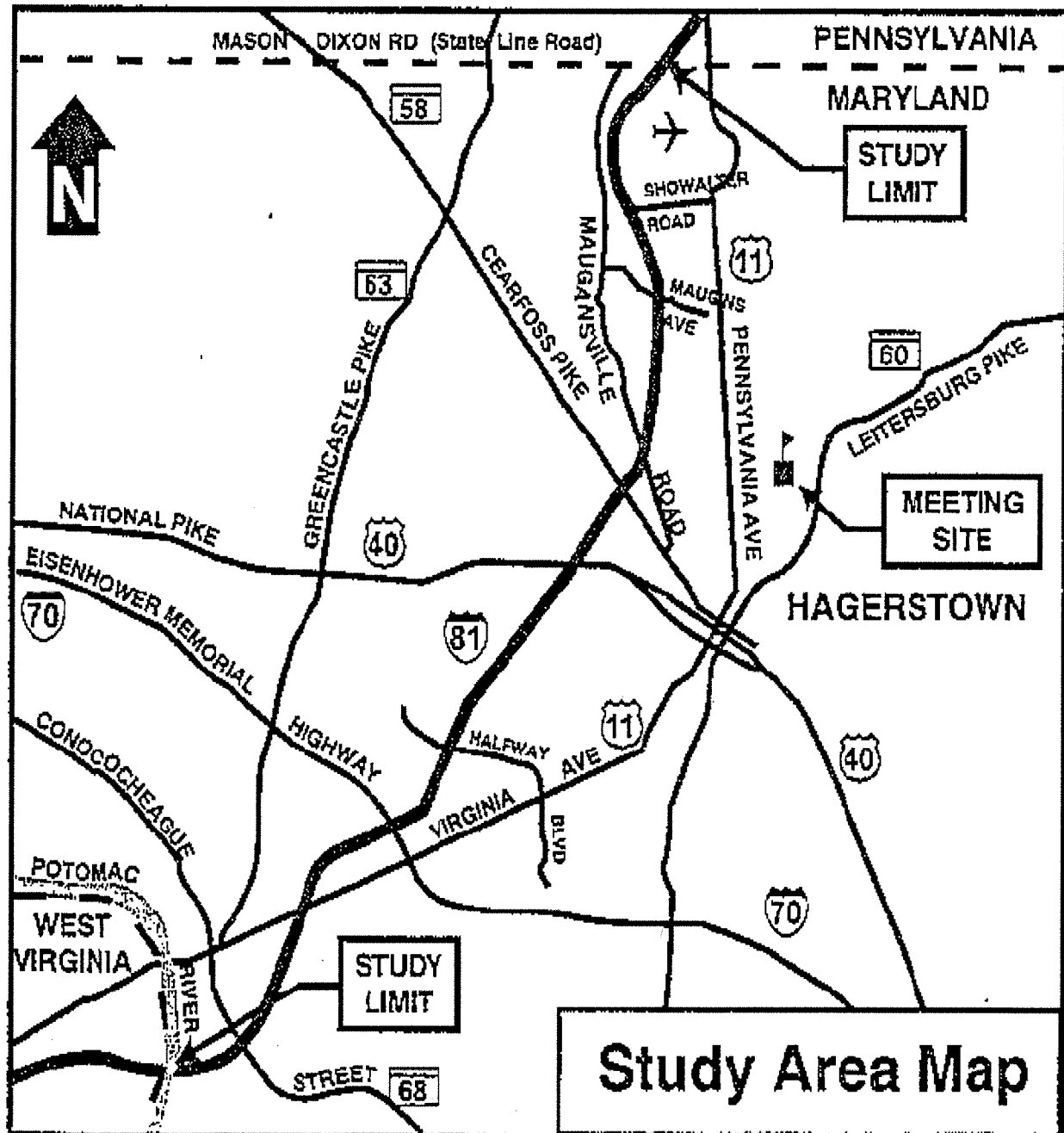


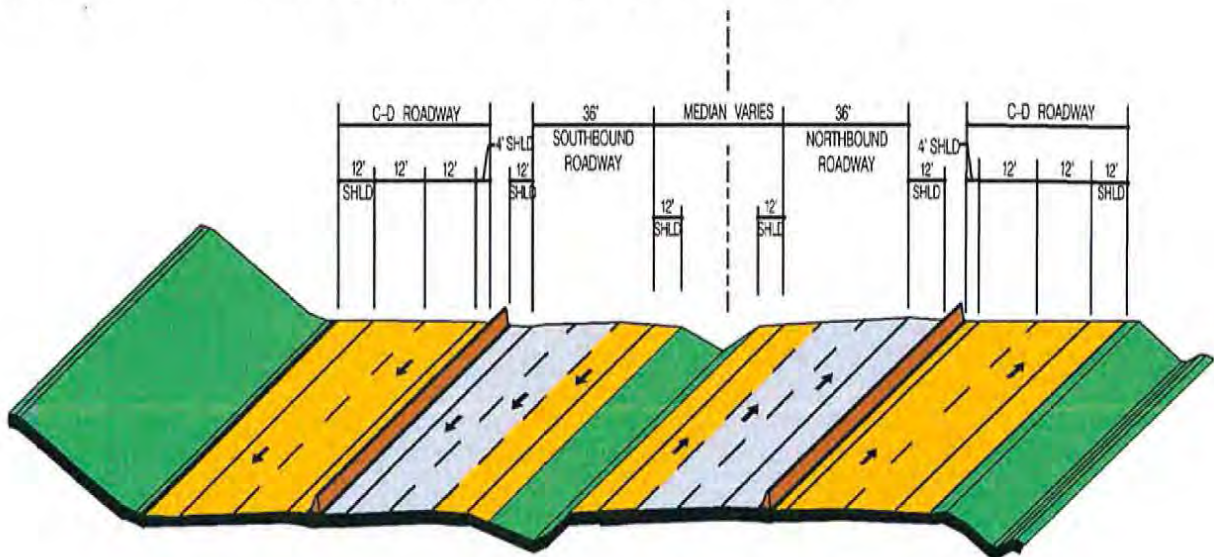
Figure 1: Project Map

## **PROJECT SCOPE**

Scope of work for this project includes:

- Construction of a third through lane on the inside of the existing travel lanes toward the median
- Resurfacing of the existing travel lanes to install new pavement markings
- Full/Partial reconstruction of ten interchanges
  - Exit 1: I-81 @ MD 68/ MD 63
  - Exit 2: I-81 @ US 11
  - Exit 4: I-81 @ I-70
  - Exit 5: I-81 @ Halfway Boulevard
  - Exit 6: I-81 @ US 40
  - Exit 7: I-81 @ MD 58
  - Exit 9: I-81 @ Maugan Avenue
  - Exit 10: I-81 @ Showalter Road
  - Exit 1 (Pennsylvania): I-81 @ PA 163
- Full reconstruction of eleven bridges (including the Potomac River Bridges) and the widening of additional thirteen bridges
- Construction of a two-lane Collector Distributor (C-D) road system between I-70 interchange and Halfway Boulevard

A typical cross section of the proposed roadway is provided below.



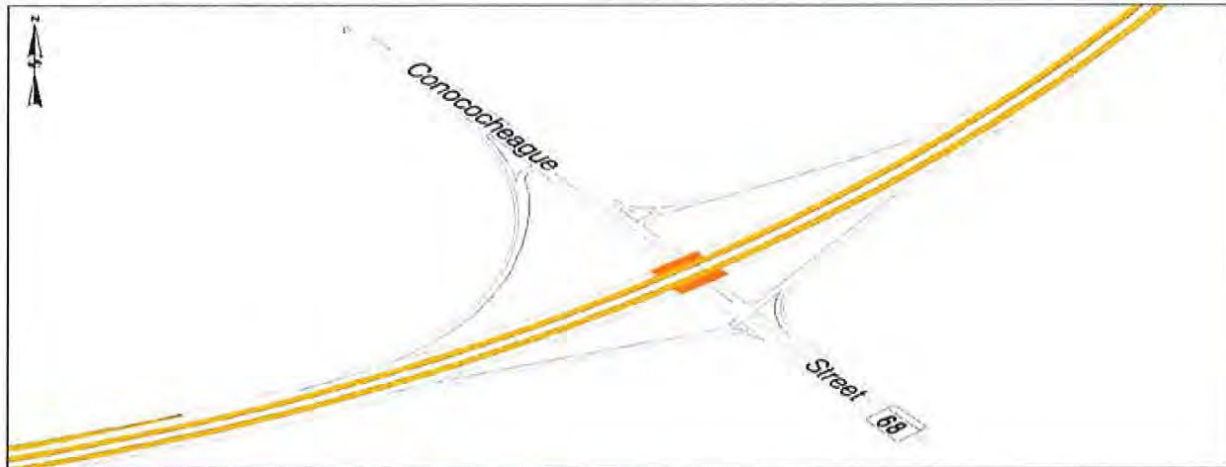
**Figure 2: Typical Section – Inside Widening with C-D Roads**

During the detailed design phase of the breakout project Phase 1, MDSHA made some further modifications to the above typical section. The inside (median) shoulder widths were reduced to four feet to accommodate storm water management facilities. Also, the outside shoulder was retained at the existing ten-foot width to preserve the existing at the MD 68/MD 63 structure.



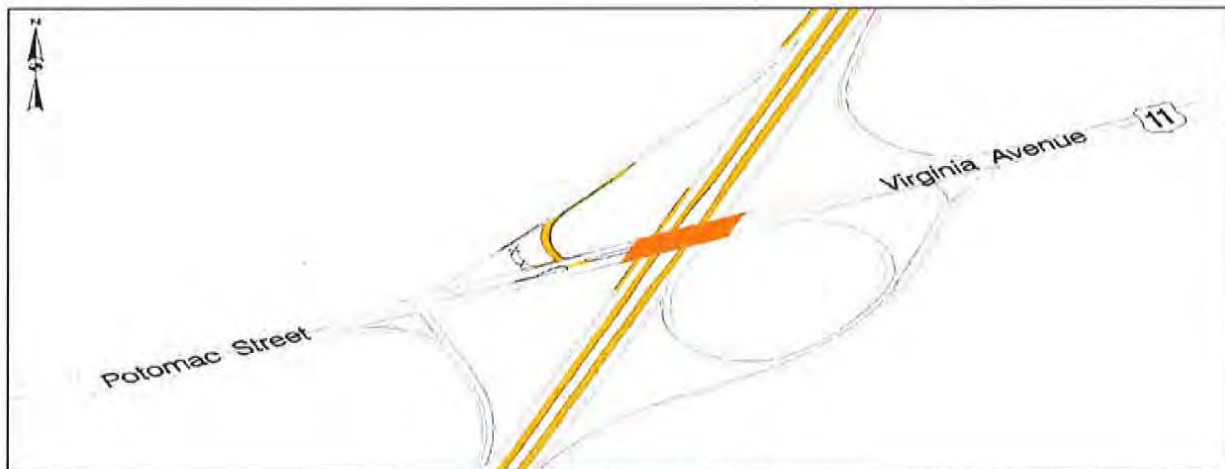
The improvements at the interchanges proposed with the SHA Selected Alternate include the following:

**Exit 1: MD 68/MD 63** – The acceleration lane from Conococheague Street (MD 68) to southbound I-81 will be extended from the existing length of 500 feet to 1,230 feet.



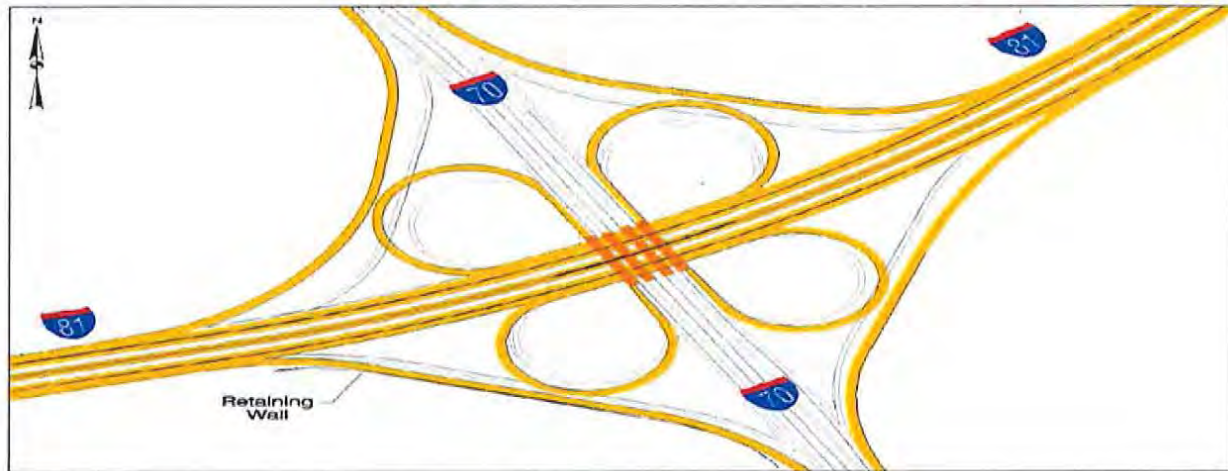
**Figure 3: Exit 1 MD 63/68**

**Exit 2: US 11** – All of the existing acceleration/deceleration lanes will be extended to at least 1,200 feet, except for the deceleration lane provided for traffic traveling from northbound I-81 to US 11.



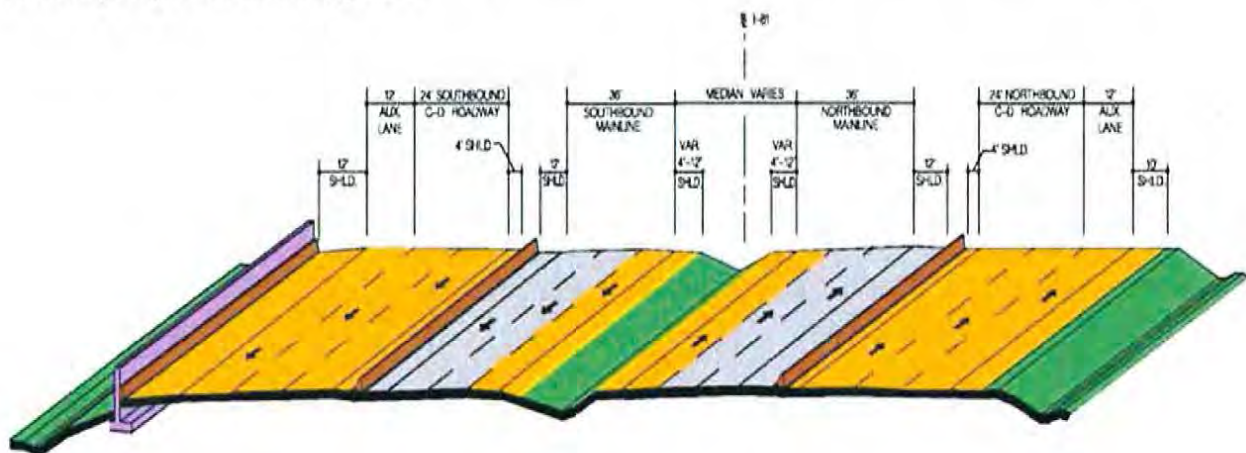
**Figure 4: Exit 2 US 11**

**Exit 4: I-70** – This interchange will be completely reconstructed due to the existing poor geometry and lack of acceleration/deceleration lanes on both I-81 and I-70. Due to the proximity of the Halfway Boulevard interchange, an auxiliary lane will be provided to connect the I-70 westbound off-ramp to the Halfway Boulevard eastbound off-ramp.



**Figure 5: Exit 4 I-70**

A two-lane C-D road will be constructed from the I-70 interchange (Exit 3) through the current Halfway Boulevard interchange (Exit 4) as follows. A typical section of this portion of the roadway is provided as Figure 2.



**Figure 6: I-81 at the I-70 interchange**

**Northbound I-81** – The two-lane northbound C-D road will begin approximately 2,300 feet north of US 11 as a two-lane exit ramp. The outside lane will provide drivers with two options: connect with the I-70 eastbound ramp or continue through the interchange. The inside lane will continue through the interchange. An auxiliary lane will join the two-lane C-D road at the I-70 on-ramp and continue north to the Halfway Boulevard interchange, ending at the off-ramp to eastbound Halfway Boulevard. The two-lane C-D road will then merge back to I-81 approximately 3,000 feet north of Halfway Boulevard. All movements to and from I-70 and Halfway Boulevard will be made from this C-D road.

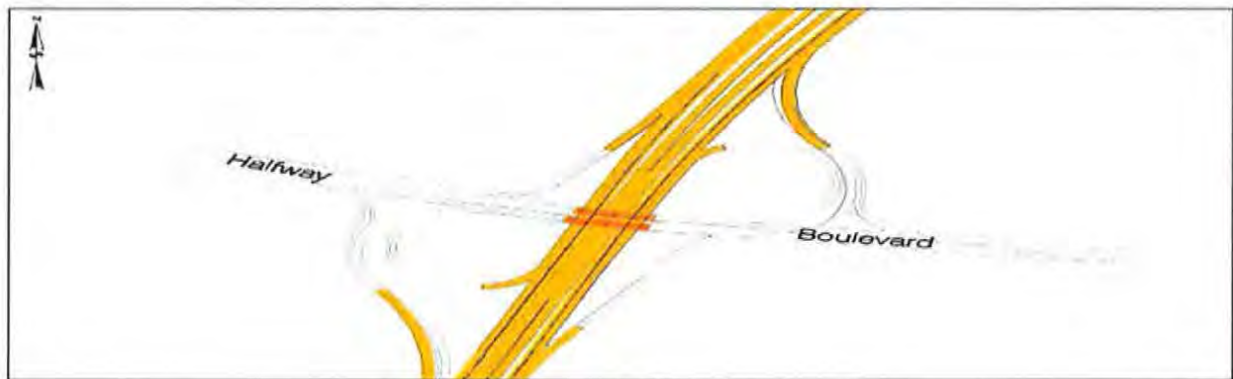
**Southbound I-81** – The two-lane southbound C-D road will begin approximately 3,300 feet north of Halfway Boulevard. It will continue through the Halfway Boulevard interchange with a



third auxiliary lane connecting the on-ramp from Halfway Boulevard to the I-70 westbound off-ramp. The C-D road will then merge back with the mainline approximately 2,500 feet north of the US 11 exit ramp gore.

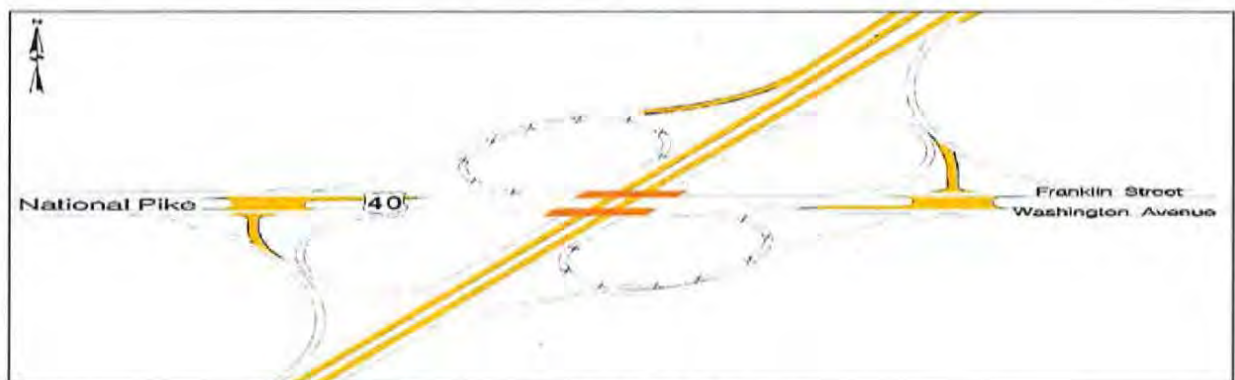
The construction of the C-D road will move the merge and diverge movements off the mainline onto the C-D road where the lower speeds and volumes will allow these movements to be safer. This will significantly improve the operations and safety along the mainline.

**Exit 5: Halfway Boulevard** - The existing Halfway Boulevard structure was designed to allow for the inside widening of I-81. However, in order to provide the C-D road, it will be necessary to construct a retaining wall along Halfway Boulevard. Additionally, the ramp tie-ins will be upgraded to meet current design guidelines.



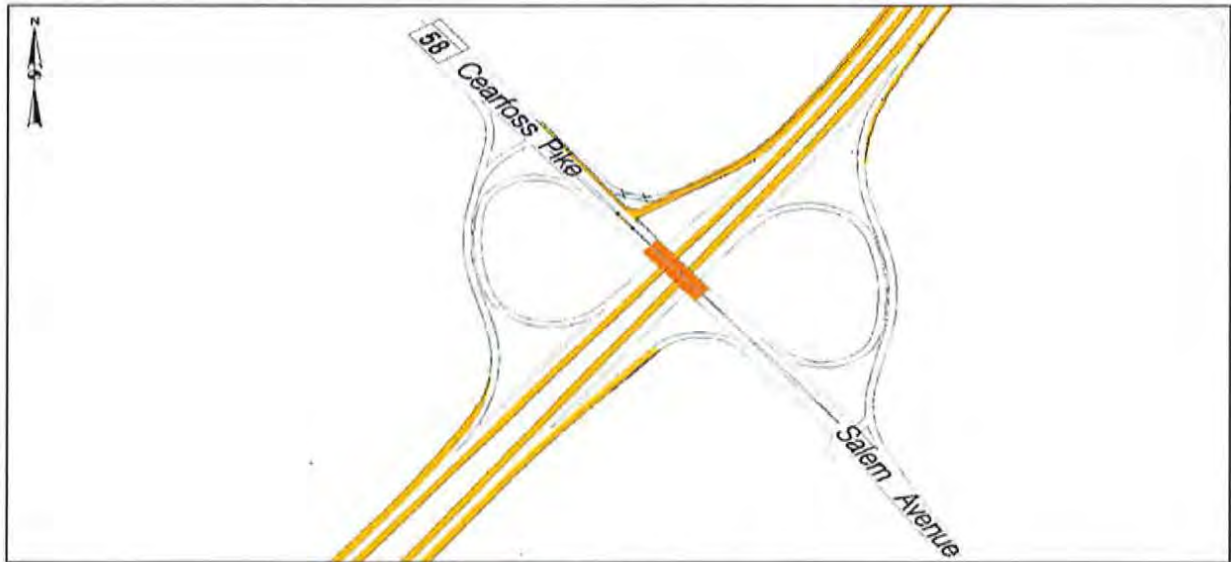
**Figure 7: Exit 5 Halfway Boulevard**

**Exit 6: US 40** – The interchange will be converted from a full cloverleaf to a diamond or partial cloverleaf design. The ramps in the northwest (US 40 west to I-81 south) and southeast (US 40 east to I-81 north) quadrants will be removed and replaced with slip ramps. Left turn lanes will be constructed for US 40 eastbound to I-81 northbound and for US 40 westbound to I-81 southbound. Due to the distance between this interchange and Exit 6, an auxiliary lane will be provided for the northbound and southbound directions connecting the two interchanges. This will allow a weave movement rather than the merge and diverge in the short distance in addition to providing longer lengths for vehicles to accelerate and decelerate.



**Figure 8: Exit 6 US 40**

**Exit 7: MD 58** – The acceleration/deceleration lanes on the ramps to I-81 northbound and southbound will be extended from 450 feet to 1,230 feet in order to accommodate growing traffic volumes along I-81. Due to the distance between this interchange and Exit 7, an auxiliary lane will be constructed in both directions along I-81 between MD 58 (Cearfoss Pike) and the US 40 interchanges. This will allow a weave movement rather than the merge and diverge in the short distance in addition to providing longer lengths for vehicles to accelerate and decelerate.



**Figure 9: Exit 7 MD 58**

**Exit 9: Maugans Avenue** – The existing ramp to southbound I-81 will be widened to two lanes. A double left-turn lane will be constructed on westbound Maugans Avenue to I-81 southbound.



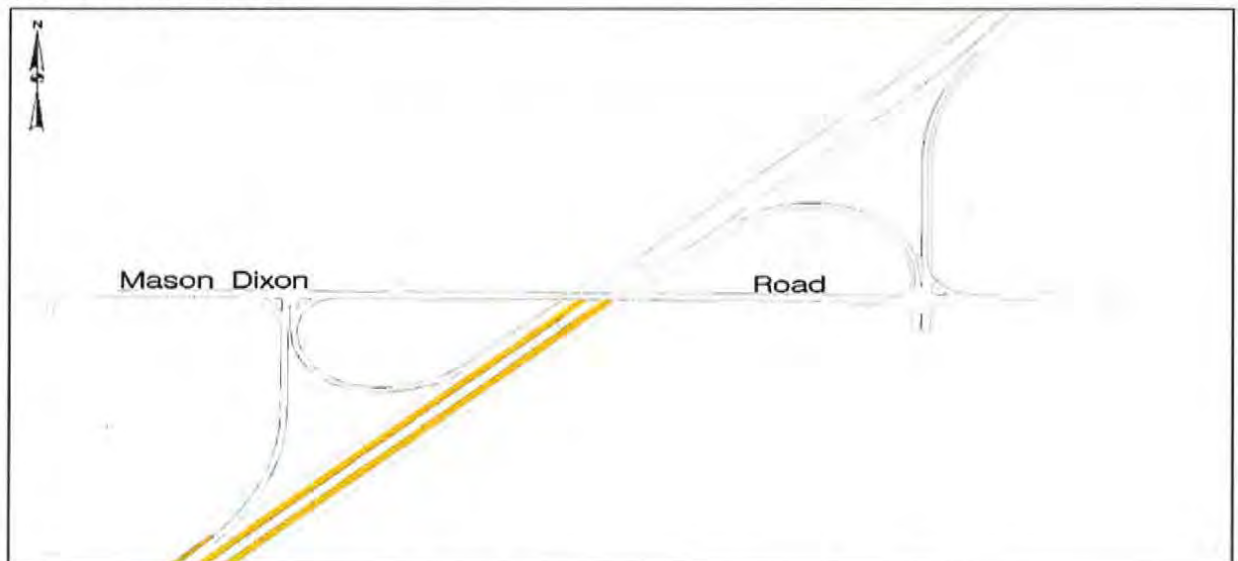
**Figure 10: Exit 9 Maugans Avenue**

**Exit 10: Showalter Road** – The existing interchange will be modified to a partial cloverleaf in order to eliminate the weave movement on I-81. Eliminating the loop ramps in the northwest and southwest quadrants and providing left turn lanes on Showalter Road will eliminate the weave between the loop ramps.



**Figure 11: Exit 10 Showalter Road**

**Exit 1 Pennsylvania: PA 163** – This interchange is half in Pennsylvania and half in Maryland. The existing acceleration lanes on the Maryland portion of the interchange will be extended from 1,056 feet to 1,230 feet.



**Figure 12: Exit 1 (Pennsylvania) PA Route 163**



## PROJECT BREAKOUT PHASES

The project will be constructed in five breakout phases (See Figure 13):

**Table 1: Breakout Phases**

<b>Breakout Phase</b>	<b>Limits</b>
Phase 1	This fully funded phase extends from the West Virginia State Line to North of MD 63/68 in Maryland for a total distance of 1.57 miles (The construction contract also includes improvements in West Virginia that are not part of MDSHA's NEPA Document – See Figure 14 on Page 19*) and includes interchange improvements at MD 68/MD 63. The WVDOH is preparing a Categorical Exclusion (CE) for the portion of this project between US 11 (in West Virginia) and the Maryland state line.
Phase 1A	This fully funded phase extends the southbound auxiliary lane from MD 58 to US 40 for a total distance of 0.57 miles – See Figure 14 on Page 19
Phase 2	This unfunded phase extends from south of US 40 to north of I-70 for a total distance of 2.57 miles and includes two interchange improvements: US 11 and I-70
Phase 3	This unfunded phase extends from south of US 40 to north of I-70 for a total length of 3.01 miles and includes two interchange improvements: Halfway Boulevard and US 40
Phase 4	This unfunded phase extends from south of US 40 to PA 163 a total length of 4.87 miles and includes four interchange improvements: MD58, Maugans Avenue, Showalter Road and PA 163

\* As part of the construction contract for Phase 1 of the I-81 Improvement Project, at the request of the West Virginia Department of Highways (WVDOH), the MDSHA has included construction of inside (median) widening of I-81 from north of US 11 to the Maryland State Line in West Virginia. All work within West Virginia is not part of the MDSHA's Major Project – NEPA document. The WVDOH and the MDSHA have entered into a Memorandum of Understanding (MOU) (See Appendix B). As per the MOU, WVDOH is responsible for 100% of the costs of improvements to the West Virginia roadways, and 26.7% of the cost of the Potomac River bridges.

The two funded breakout phases are operationally independent of each other and from the rest of the unfunded breakout phases. The breakout Phase 1 is being funded through state and federal money. The breakout Phase 1A is being funded through state money only. Construction of the two funded breakout phases: Phase 1 and Phase 1A will be done concurrently via two separate contracts. These funded phases can be opened to traffic and operate effectively without the remaining breakout phases being completed.



# I-81 Improvement Project Initial Financial Plan

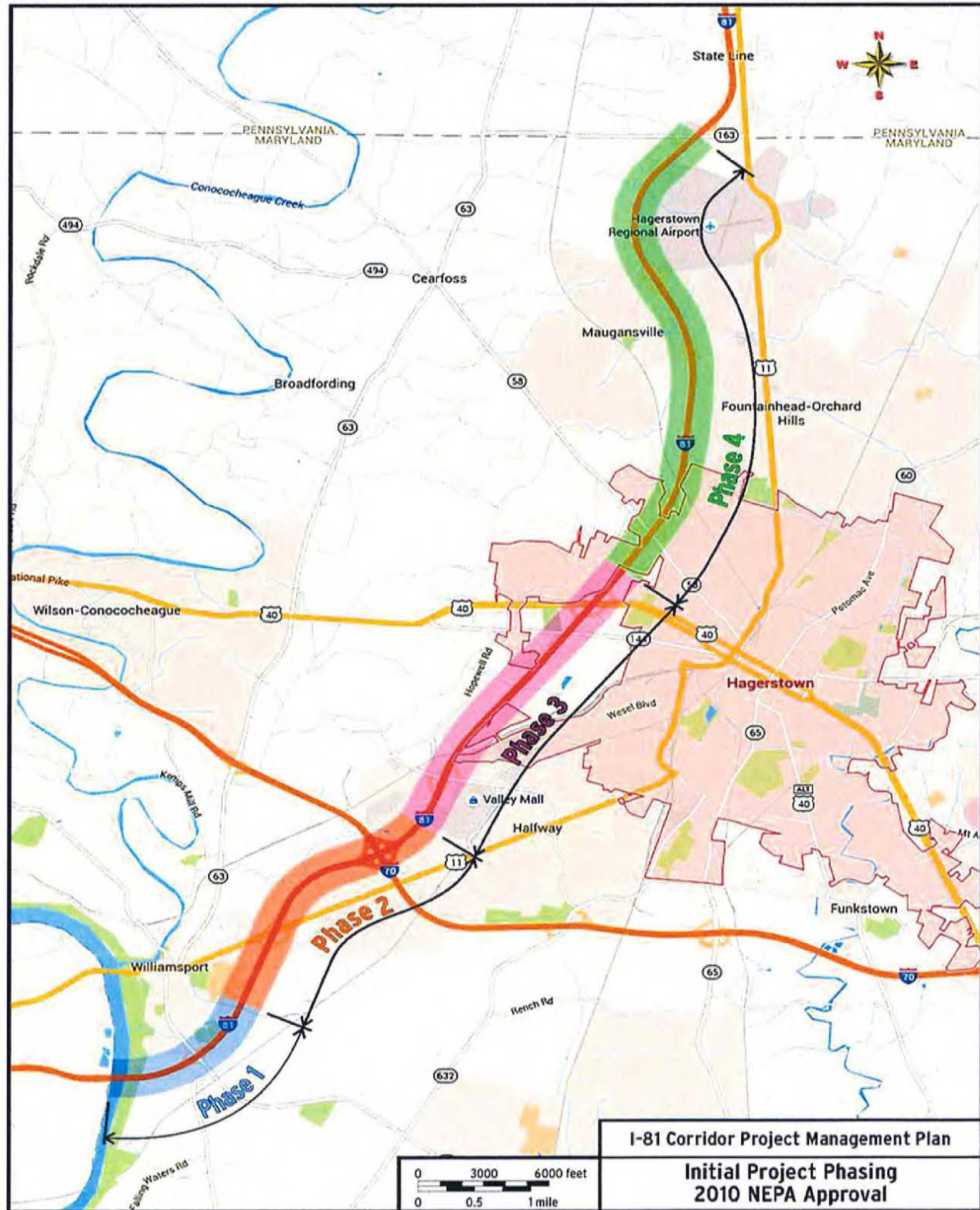


Figure 13: Location map of Project phases

# I-81 Improvement Project Initial Financial Plan

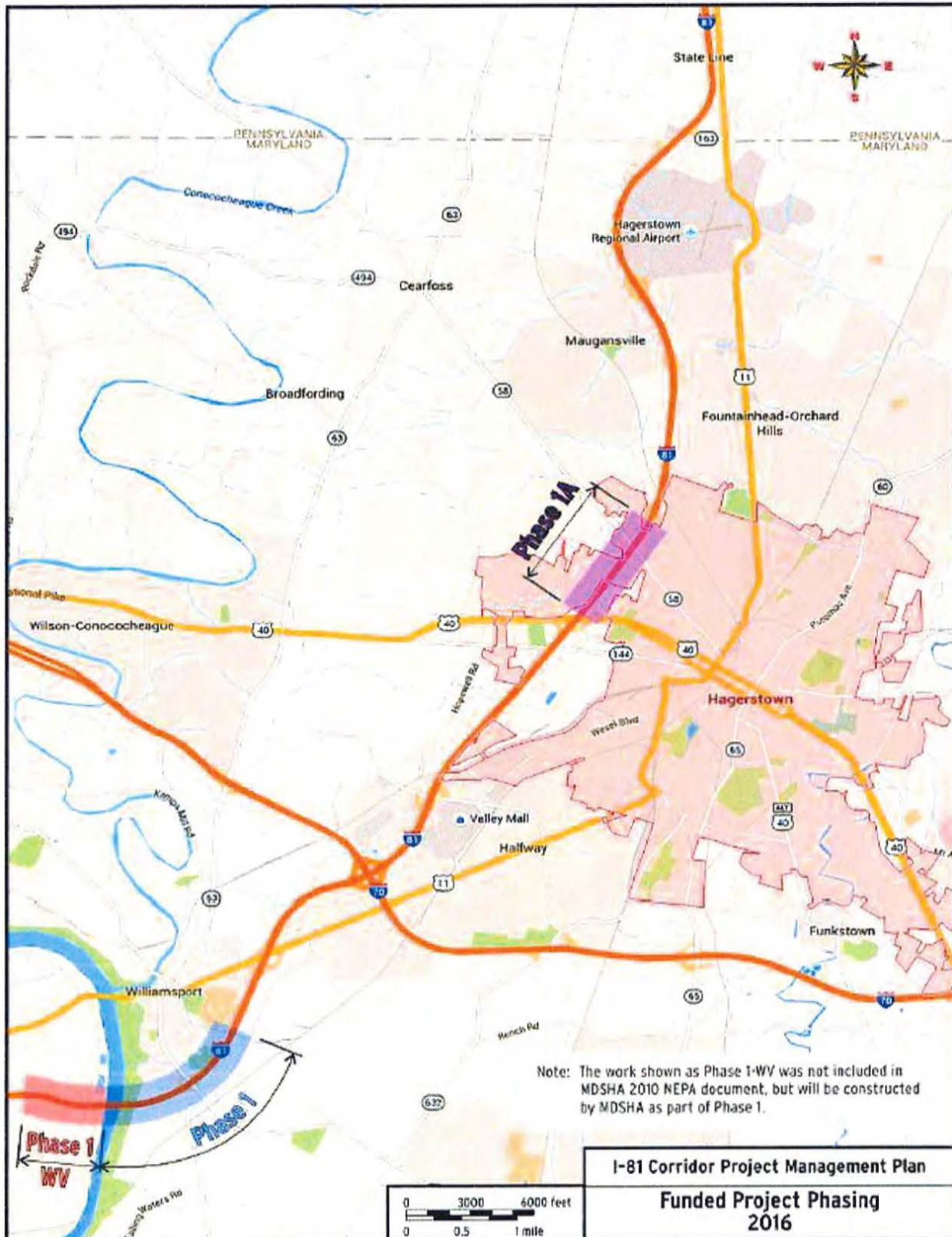


Figure 14: Location map of Funded Breakout Phases



## **SCHEDULE OF PROJECT PLANNING STUDY**

The MDSHA began a project planning Study of I-81, located in Washington County in July 2001. The project planning study encompassed identification and prioritization of deficiencies in the study area, development of a likely schedule of implementation, and estimation of a cost budget for completing the project. Informational public workshops were held on November 5, 2001, November 8, 2001 and May 26, 2004. An Alternates Public Workshop was held on June 20, 2002. The I-81 Improvement Project is listed in the State's Consolidated Transportation Program (CTP) for 2016-2021. Location approval for the project was received on February 25, 2010.

**Table 2: Schedule of Project Planning Study**

Milestone	Schedule	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Project Planning (PP) Start	07/09/2001										
Informational Public Workshop	11/05/2001										
Alternative Public Meeting	06/21/2002										
Coordination with Local Agencies	07/2002-09/2004										
Informational Public Workshop	05/26/2004										
Location Design Hearing	10/06/2004										
Technical Studies	10/2004-02/2010										
Location Approval	02/25/2010										

## **NATIONAL ENVIRONMENTAL PROTECTION ACT REQUIREMENTS**

For the purpose of developing the I-81 Improvement Project, MDSHA followed the regulatory requirements of the National Environmental Protection Act (NEPA). Agency concurrence on the Purpose and Need was received in October 2001. An Environmental Assessment for the I-81 Improvement Project was completed on September 15, 2004. The MDSHA Selected Alternate will require approximately 31.7 acres of right-of-way; however, no residential or commercial displacements are required. Within the limits of disturbance for the MDSHA Selected Alternate, 7,876 linear feet of stream, 1.19 acres of wetlands, 4.0 acres of floodplain, and 18.2 acres of woodlands will be impacted. Physical and visual effects to the Chesapeake and Ohio Canal National Historical Park will occur from the placement of new piers and inside widening of the Potomac River Bridge. The MDSHA Selected Alternate includes measures to mitigate impacts to streams, wetlands, forests, parkland, and historic resources.

A total of 16 Noise Sensitive Areas (NSAs) were identified within the project area. One hundred and fifteen receptor sites were used to best represent the existing and future noise environment. Although 13 of the 16 NSAs (A, B, C, D, F, G, I, J, K, L, M, N, O, P) warranted further investigation of a sound barrier, only four NSAs (D, F, I, and P) were determined to be eligible for noise abatement due to impacts resulting from the proposed roadway improvements.

The use of one Section 4(f) resource within the project area will be required by the MDSHA Selected Alternate. This resource, the Chesapeake and Ohio Canal National Historical Park (C&O Canal NHP), qualifies for protection under Section 4(f) as both a public park/recreation area and as a historic site. The C&O Canal NHP is located at the southern end of I-81 along the Maryland side of the Potomac River and is the only park within the I-81 project area. As a result of the impacts to the C&O Canal NHP, MDSHA has consulted with the National Park Service

(NPS) and MHT to develop a Memorandum of Agreement (MOA) to address the adverse effects to the C&O Canal NHP. The MOA was approved by the Federal Highway Administration (FHWA), MDSHA, NPS, and MHT on November 19, 2008.

The I-81 Corridor Improvement Project is a project planning study for which an Environmental Assessment was completed on September 15, 2004 and a Finding of No Significant Impact (FONSI) was issued on February 25, 2010 for the project due to minimal impacts to resources. The FONSI describes how the selected alternative was chosen to minimize impacts to environmental resources. A comprehensive mitigation and environmental stewardship package was implemented to mitigate for unavoidable impacts during development of the final breakout projects.

### **NEPA Reevaluations**

The MDSHA is currently preparing an environmental reevaluation for the Maryland portion of the Phase 1 of the I-81 Corridor Improvement Project, which extends from West Virginia Stateline to MD 68/ MD 63. The WVDOH is preparing a Categorical Exclusion (CE) for the portion of this project between US 11 (in West Virginia) and the Maryland state line. The CE will address the environmental impacts associated with the widening of I-81 from four to six lanes from the I-81/US 11 interchange to the Maryland state line. The CE is expected to be approved by FHWA West Virginia Division in Spring-Summer 2016. The MDSHA also completed an environmental reevaluation for Phase 1A, which extends along southbound I-81 from MD 58 to US 40, on February 18, 2016.

These environmental reevaluations evaluate and document changes in project scope; engineering design; environmental conditions; environmental laws, regulations, and policies; or changes in socio-economic, cultural, and natural environmental impacts since the approval of the FONSI to determine if supplemental NEPA documentation is required. The environmental reevaluation for Phase 1 is expected to be approved by the FHWA in Spring-Summer 2016.

### **Memorandum of Agreement**

In 2008, a Memorandum of Agreement (MOA) was executed between the FHWA, MDSHA, NPS, and MHT to satisfy the requirements of Section 106. The MDSHA coordinated with the FHWA, NPS, and MHT during the final design stage and, because the current design of Phase 1 minimizes impacts to the C&O Canal NHP and its users, all signatories agreed that the 2008 MOA should be amended. Amendments to the MOA were agreed upon by all signatories and the amended MOA is expected to be executed on April 11, 2016.



## **SECTION 2 - PROJECT COMPLETION SCHEDULE**

### **SCHEDULE OF FUNDED PHASES**

**Phase 1** - Phase 1 from the West Virginia state line to MD 63/MD 68 will be advertised in May 2016. Construction is expected to be complete in June 2019 (See Table 3).

**Table 3: Breakout Phase 1 –West Virginia State Line to MD 63/MD 68 (Funded)**

Milestone	Date	2016	2017	2018	2019	2020	2021
Advertisement	May-16						
Bid Opening	June-16						
Notice to Proceed	August-16						
Construction complete	June-19						
Project Close out	June-21						

At the CER, the MDSHA provided a July-16 to June-19 construction schedule timeframe for the breakout project Phase 1. Subsequent to the CER, a two year project close out time was added to the schedule to allow close out activities involving expenditures and other financial transactions related to the project to complete.

**Phase 1A** –Phase 1A from MD 58 to US 40 was advertised on March 22, 2016. Construction is estimated to be completed in June 2017 (See Table 4).

**Table 4: Breakout Phase 1A - South of MD 58 to North of US 40 (Funded)**

Milestone	Date	2016	2017	2018	2019
Advertisement	March-16				
Bid Opening	April-16				
Notice to Proceed	July-16				
Complete Construction	June-17				
Project Close out	Jul-19				

At the CER, the MDSHA provided a June -16 to July-17 construction schedule timeframe for the breakout project Phase 1A. Subsequent to the CER, a two year project close out time was added to the schedule to allow close out activities involving expenditures and other financial transactions related to the project to complete.

### **SCHEDULE OF UNFUNDED PHASES**

Phases 2, 3 and 4, which consists of the remaining 11 mile corridor between MD 63/68 and the Pennsylvania border, will be candidates for design, right-of-way, and construction funding in the future (See Table 5).

**I-81 Improvement Project  
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**Table 5: Schedule of I-81 Phase 2-4 Estimated Completion Year**

Unfunded Breakout Projects	Schedule Year	Completion Year																	
		2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Phase 2	2017-2022																		
Phase 3	2023-2028																		
Phase 4	2029-2034																		



## **SECTION 3 – PROJECT COST**

### **STRUCTURE OF THE COST ESTIMATE**

The MDSHA has divided the cost estimate for the I-81 Improvement Project into five major breakouts (Phases 1, 1A, 2, 3 and 4) as described in Section 1 and in Table 1 on Page 15. Within each breakout, MDSHA identified six cost elements to break down the estimate to greater level of detail, as shown in Table 6.

**Table 6: Cost Elements**

<b>Cost Element</b>	<b>Description</b>
<b>Project Planning</b>	Costs incurred prior to the commencement of detailed engineering primarily related to feasibility analysis, community involvement and environmental review/permitting activities
<b>Detailed Engineering</b>	Costs include efforts to complete detailed engineering, including contract plans, specifications and itemized estimate
<b>Right-of-Way</b>	Costs include all non-mitigation related right of way, including Production Consultants, Property Managers, Production/Property Management Oversight, and State staffs
<b>Neat Construction</b>	Costs include construction contracts for all breakouts
<b>Construction Overhead</b>	Costs include construction administration for both the contracts and internal State charges to the contracts
<b>Change Order Allowance</b>	Costs include four percent of Neat Construction assigned to handle changes that are identified after the contract has been awarded

### **COST ESTIMATE METHODOLOGY**

The methodology below explains how the MDSHA derived the cost estimate in current and year of expenditure dollars for the I-81 Improvement Project.

#### **Cost Estimate in Current Dollars (2016\$)**

Step 1: The MDSHA provided previous expenditures as of December 1, 2015 (\$9,138,000) and a current year cost estimate (as of FY 2016) for the project to the Federal Highway Administration for the Cost Estimate Review (CER). The previous expenditures were noted on the CER report as cost-to-date and included the following: For the breakout Phase 1 project - \$3,514,000 for Project Planning by the MDSHA, \$125,000 for Project Planning by the WVDOH, \$5,099,000 for Detailed Engineering which includes \$1,000,000 by the WVDOH, and for the breakout Phase 1A project - \$400,000 for Detailed Engineering by the MDSHA.

The Phase 1 funded breakout includes a cost share by the WVDOH. As per the Memorandum of Understanding between the MDSHA and WVDOH, West Virginia is responsible for 100% of the West Virginia roadway cost and 26.7% of the Potomac River bridge cost. Maryland is responsible for the remaining portion of the cost of Phase 1.

## I-81 Improvement Project Initial Financial Plan

Based on the estimates provided by the MDSHA, the FHWA developed base costs for funded breakouts and the corridor project for the purpose of the CER. Appendix A Table A – Summary of the Pre-CER Total Cost Estimate (2016\$), provides an overview of these costs.

Step 2: The FHWA performed the CER using the information provided by MDSHA. However, after the CER, MDSHA identified that the original estimate had some discrepancies. The actual project planning and detailed engineering expenditures were different from what MDSHA provided to the FHWA before the CER. The individual breakout phase estimates that MDSHA provided to FHWA before the CER were also incorrect due to a calculation error. The actual previous expenditures as of December 1, 2015 (noted on the CER report as cost-to-date) was \$8,452,000 which included the following: For the I-81 Improvement Project - \$3,517,000 for Project Planning by the MDSHA, \$125,000 for Project Planning by the WVDOT, for breakout project Phase 1 - \$4,410,000 for Detailed Engineering which includes \$1,000,000 by the WVDOT, and for the breakout Phase 1A project - \$400,000 for Detailed Engineering by the MDSHA. At the time of preparation of this Initial Financial Plan the MDSHA has further updated the previous expenditure as of March 15, 2016. This necessitated to revise the Project Planning cost by MDSHA to \$3,526,038. Although, the CER results was not changed to reflect these corrections, the MDSHA used the corrected numbers for the analysis necessary for the development of this Initial Financial Plan.

The base cost used by the FHWA included the entirety of the project planning cost. MDSHA considered that the project planning cost was for the corridor project. Therefore, MDSHA adjusted the base cost to include only a proportional amount of the project planning cost attributable to the funded breakouts.

Appendix A also includes an expanded listing of the Pre-CER cost estimates in Table B – Details of the MDSHA Corrected Pre-CER Total Cost Estimate (2016\$). After MDSHA adjustments, the Pre-CER Total Cost Estimate (2016\$) decreased from \$568,980,132 (see Appendix A - Table A) to \$563,429,226 (see Table 7 below).

The following Table summarized the MDSHA Corrected Pre-CER Total Cost Estimate (2016\$).

**Table 7: MDSHA Corrected Pre-CER Base Cost Estimate (2016\$)**

<b>Breakout Projects</b>	<b>Cost</b>	<b>Overhead</b>	<b>Contingency*</b>	<b>Estimated Completion Year (FY)</b>
Phase 1 (Funded)	\$95,557,679	15.3%	0%	2019
Phase 1A (Funded)	\$10,940,623	14.4%	5%	2017
Phase 2 (Unfunded)	\$112,374,399	15.3%	35%	2017-2022
Phase 3 (Unfunded)	\$131,613,596	15.3%	35%	2023-2028
Phase 4 (Unfunded)	\$212,942,928	15.3%	35%	2029-2034
<b>Total Projects Cost</b>	<b>\$563,429,226</b>	-	-	-

\*Contingency (design) A Contingency percentage is the amount added to the estimated construction cost to account for unknowns throughout the design process.

The following percentages are typically applied:

- Project Planning Phase – 25-40%
- Detailed Engineering (Preliminary Investigation) – 25%
- Detailed Engineering (Semi-Final Review) – 15%
- Detailed Engineering (Final Review) – 5 to 10%
- Detailed Engineering (PS&E) – 0%

Step 3: Construction change orders are a major contingency for the cost estimate. In MDSHA's standard operating procedure, change order costs for the entire Administration is accounted for in a separate allowance category rather than including this cost for individual projects. The Federal Highway Administration adjusted the base costs to include a 4% change order allowance. FHWA adjustment applied the adjustment to the total project cost instead of the construction cost only. The MDSHA adjusted the corrected base construction costs from Step 2 to include a 4% change order allowance.

Appendix A also includes an account of how the change order allowance is accommodated in Table C – Details of the MDSHA Corrected Pre-CER Total Cost Estimate (2016\$) Adjusted with Change Order Allowance.

Step 4: MDSHA computed the cost ratios of right-of-way and construction, each breakout Phase, and the Maryland and West Virginia costs. MDSHA used these ratios to apportion the Year of Expenditure costs in a later step.

Appendix A details this ratio analysis in Table D – Funded and Unfunded Breakout Project Pre-CER Cost Ratios.

### **Basis for Escalation**

The I-81 Improvement Project cost estimate incorporated the standard MDSHA inflation calculation methodology to determine the additional costs due to inflation. MDSHA employs an annual escalation factor based on inflation rates through project completion to adjust project costs to the year of expenditure (YOES). To ensure total consistency, MDSHA used the same escalation factor as the one used in the State's Consolidated Transportation Program, and the rates used to develop the projects in the Hagerstown/Eastern Panhandle Metropolitan Planning Organization Constrained Long Range Plan.

Appendix A, Table E shows a summary of the annual escalation factors utilized as the basis for the inflation induced escalation. MDSHA is firmly committed to utilizing a reasonable and rational set of inflation gauges to set the assumed escalation rate for the I-81 Improvement Project. There are countless variables that could impact the overall inflation trend for the Washington, DC region, and MDSHA acknowledges that future inflation rates may be higher or lower than those assumed for this project. If these inflation gauges are pointing to a change in the inflation rate, an updated year of expenditure cost estimate will be included in the annual update to this plan to more accurately summarize the financial health of the project.

### **Probabilistic Cost Estimate in Year of Expenditure \$**

With the 2016\$ cost estimate and basis for escalation complete, the FHWA and MDSHA developed the year of expenditure dollar (YOES) estimate based on the following methodology:

## I-81 Improvement Project Initial Financial Plan

Step 5: The FHWA considered a variety of cost uncertainty factors and ran Monte Carlo Simulation for the Year of Expenditure with forecasts for the combined funded phases and the corridor project (including the West Virginia portion). The simulation results showed probabilistic Year of Expenditure estimates for 0% to 100% confidence. Since only the funded phases at this time have gone through detailed engineering, MDSHA has decided to use the 70% estimate (\$125,236,344) for the funded phases.

Step 6: MDSHA calculated the 20% to 80% costs for the unfunded phases by subtracting the 20% to 80% costs for the funded phases from the 20% to 80% costs for the corridor project FHWA developed in Step 5.

The following table describes the Monte Carlo Simulation 20%-80% estimated year of expenditure dollar costs for the funded phases and 20%-80% calculated year of expenditure dollar costs for the unfunded phases. These costs match the FHWA CER report. Since the unfunded breakout phases have not gone through detailed engineering, the MDSHA has decided to use a range of 20% to 80% costs for the unfunded phases (\$628,689,667-\$697,580,531).

**Table 8: FHWA CER Monte Carlo Simulation Year of Expenditure (YOE) Cost**

Total Project			Funded			Unfunded	
20%	70%	80%	20%	70%	80%	20%	80%
\$744,886,082	\$811,106,629	\$825,262,188	\$116,196,415	\$125,236,344	\$127,681,657	\$628,689,667	\$697,580,531

Step 7: MDSHA used the cost ratios developed in Step 4 (Appendix Table D) to apportion the Year of Expenditure costs between right-of-way and construction, breakout phases, and the Maryland and West Virginia costs. The Monte Carlo Simulation 70% estimated year of expenditure dollar costs (\$125,236,344) is being used as the baseline budget amount for funded breakout phases. MDSHA then compared these costs with the current funding levels to determine the additional funding commitment needed for the funded breakout project. All project planning costs of funded breakout phases and portions of the detailed engineering costs shown on Table 9 are previous expenditures. See Table 10 for details. Appendix A -Table E (1-3) show details of the Year of Expenditure Cost Estimate (YOE\$).

### SUMMARY OF COST ESTIMATES

The following table summarizes the project cost estimates based on the year of expenditure dollar. The summary allocates the project costs by breakouts, and individual phases.

**Table 9: Maryland's Year of Expenditure (YOE\$) Cost for Funded Breakout Projects**

Funded Breakout Projects	70% (YOE)	Phase 1		Phase 1A	Total YOE Cost	
		MD	WV	MD	MD	WV
Project Planning	\$125,236,344	\$459,375	\$125,000	\$0	\$459,375	\$125,000
Detailed Engineering		\$3,410,000	\$1,000,000	\$400,000	\$3,810,000	\$1,000,000
Subtotal		\$3,869,375	\$1,125,000	\$400,000	\$4,269,375	\$1,125,000
Right-of-Way		\$12,532	\$4,565	\$0	\$12,532	\$4,565
Construction Cost		\$61,580,966	\$45,749,672	\$12,494,234	\$74,075,201	\$45,749,672
Total Project cost		\$65,462,873	\$46,879,236	\$12,894,234	\$78,357,107	\$46,879,236

**COSTS INCURRED TO DATE (JULY 2001 THROUGH MARCH 15, 2016)**

As noted in the following Table 10, the I-81 Improvement Project has expended \$6,809,351 from July 2001 through March 15, 2016, out of a total estimated project cost of \$754 - \$823 million. Expenditures to date included project planning, detailed engineering to support the NEPA process, and represent approximately 1% of the total cost estimate.

**Table 10: Maryland's Total Expenditure through March 15, 2016 for the Project**

Breakouts	Phase 1	Phase 1A	Phase 2	Phase 3	Phase 4	Total
<b>Project Planning</b>	\$459,375	\$0	\$3,066,663			\$3,526,038
<b>Detailed Engineering</b>	\$2,867,152	\$416,161	\$0	\$0	\$0	\$3,283,313
<b>Total Expenditure</b>	\$3,742,688 <sup>a</sup>		\$3,066,663			<b>\$6,809,351</b>

<sup>a</sup> This includes \$459,375 for Phase 1, therefore, total expenditure attributable to funded phases is \$3,742,688, or ~\$3.8 M mentioned in the Executive Summary on page 8.

## SECTION 4 - PROJECT FUNDS

The I-81 Improvement Project will be financed through a combination of federal and state funding. The MDSHA has committed funds to fully fund their portion of Phase 1 as well as Phase 1A of the project. Transportation Projects throughout the state of Maryland are funded by the state Transportation Trust Fund (TTF) in addition to federal funding contributions coming from the National Highway Performance Program (NHPP). Revenue sources in the trust fund include fuel taxes, sales taxes on new and used motor vehicles and motor vehicle registration fees.

Table 11 below shows the funding commitment necessary by the MDSHA to complete Phase 1 and Phase 1A breakout projects in 70% year of expenditure dollars. The MDSHA computed these figures by subtracting the actual expenditures shown in Table 10 from the estimated 70% year of expenditure costs shown in Table 9.

**Table 11: Projected Funding Allocations Needed for Funded Breakouts**

Breakouts	Phase 1			Phase 1A	Total
	MD	WV	Total	MD	
DE	\$542,848	\$1,000,000 <sup>a</sup>	\$1,542,848		\$1,542,848
ROW	\$12,532	\$4,565	\$17,097	-	\$17,097
Construction	\$61,580,966	\$45,749,672	\$107,330,638	\$12,494,234	\$119,824,872
<b>Total</b>	<b>\$62,136,346</b>	<b>\$46,754,237</b>	<b>\$108,890,583</b>	<b>\$12,494,234</b>	<b>\$121,384,817<sup>b</sup></b>

<sup>a</sup> Funding allocation needed by the WVDOH for Detailed Engineering includes \$1,000,000, as per the MOU

<sup>b</sup> ~\$121.4 M funding allocation necessary for the funded breakout phases mentioned in the Executive Summary on page 8

The Hagerstown/Eastern Panhandle Metropolitan Planning Organization (HEPMPO) approved its FY 2017-2020 Transportation Improvement Program (TIP) on May 18, 2016 to reflect the FY 2017-2020 portion of the funding allocations shown in this section. On May 24, 2016 HEPMPPO forwarded the TIP to FHWA for approval.

### PHASE 1 FUNDS

The breakout Phase 1 is being financed using a combination of NHPP Federal funds and matching state funds.

#### West Virginia Funding Sources

The funding commitment from the WVDOH is being secured via execution of the MOU (See Appendix B) between the MDSHA and the WVDOH. According to Table E2 in the Appendix A, the WVDOH is responsible for \$46,879,236 for the construction of breakout Phase 1.

#### Maryland Funding Sources

According to Table E2 in the Appendix A, the MDSHA is responsible for \$61,580,966 for the construction of breakout Phase 1.



## I-81 Improvement Project Initial Financial Plan

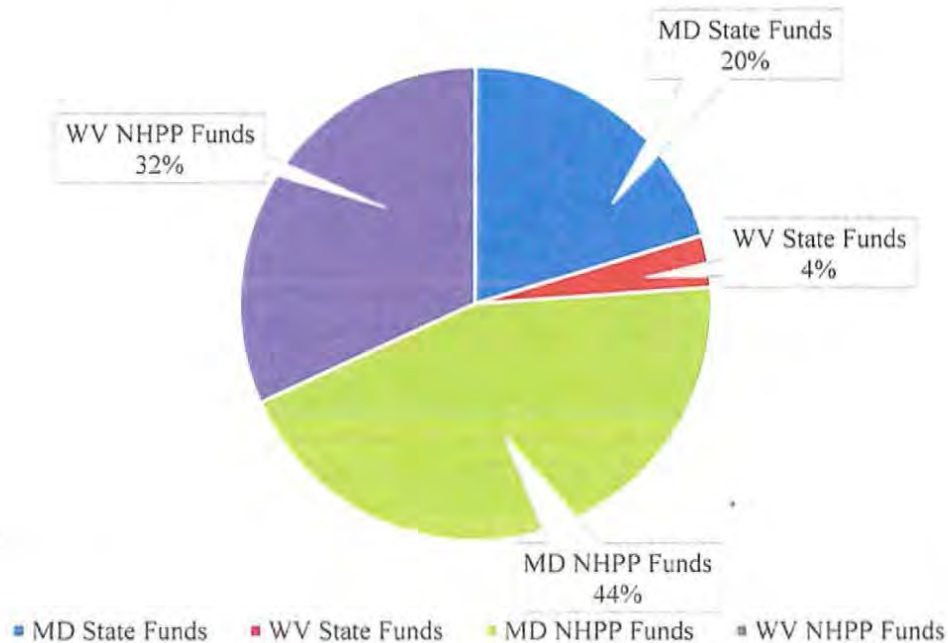
The funding allocations for FY 2017-2020 is shown in table 12 and the pie-chart below.

**Table 12: Phase 1 Funding Allocations**

Phase 1 Funding Allocations		State Funds	Federal Funds (NHPP)	Total
Funds				
Project Planning	MD	\$461,000	\$3,056,000	\$3,517,000
	WV	\$0	\$0	\$0
	Total	\$461,000	\$3,056,000	\$3,517,000
Detailed Engineering	MD <sup>a</sup>	\$6,067,000	\$0	\$6,067,000
	WV <sup>b</sup>	\$135,000	\$1,215,000	\$1,350,000
	Total	\$6,202,000	\$1,215,000	\$7,417,000
Right-of-Way	MD	\$0	\$0	\$0
	WV <sup>b</sup>	\$25,000	\$225,000	\$250,000
	Total	\$25,000	\$225,000	\$250,000
Construction	MD	\$15,956,000	\$45,772,000	\$61,728,000
	WV <sup>b</sup>	\$3,750,000	\$33,750,000	\$37,500,000
	Total	\$19,706,000	\$79,522,000	\$99,228,000
Total Funding	MD	\$22,484,000	\$48,828,000	\$71,312,000
	WV <sup>b</sup>	\$3,910,000	\$35,190,000	\$39,100,000
	Total	\$26,394,000	\$84,018,000	\$110,412,000

<sup>a</sup> Phase 1 estimated detailed engineering cost was \$3,410,000 The MDSHA over allocated \$2,657,000 for detailed engineering

<sup>b</sup> Funding allocations in West Virginia were shown on the HEPMPO approved 2017-2020 TIP as prior year allocations



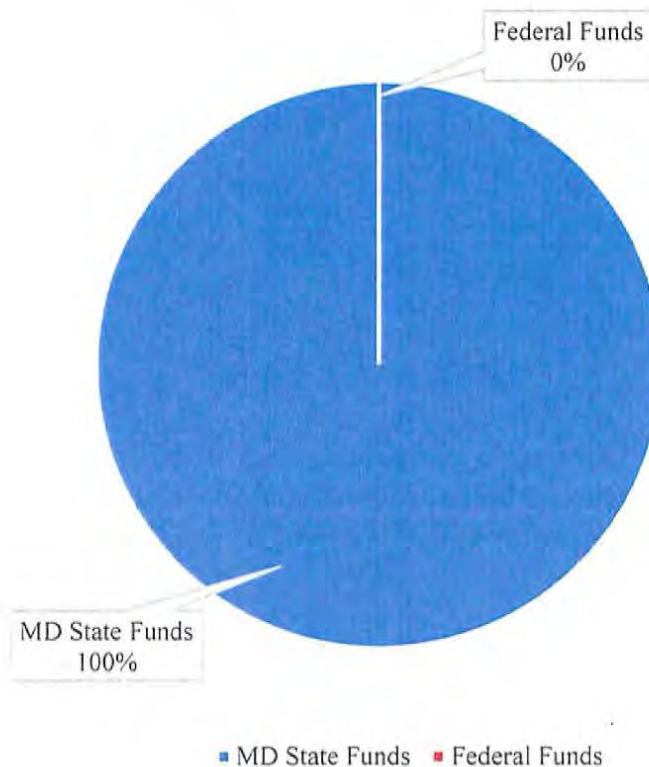
**Figure 15: Phase 1 Funding Allocation**

**PHASE 1A FUNDS**

Phase 1A project is being financed by state funds only and involves only the MDSHA. See Table 13 and the pie-chart below for more information.

**Table 13: Phase 1A Funding Allocation**

Phase	MD State Funds	Federal Funds	Total
Detailed Engineering	\$400,000	\$0	\$400,000
Right-of -Way	\$0	\$0	\$0
Construction	\$12,600,000	\$0	\$12,600,000
Total Funding	\$13,000,000	\$0	\$13,000,000



**Figure 16: Phase 1A Funding Allocation**

## **SECTION 5 – FINANCING ISSUES**

As discussed in Section 4 - Project Funds, total funding allocated for this project as shown table 12 and 13 is \$123,412,000, which is \$1.8 million less than the \$125,236,344 allocation necessary. This apparent under-allocation is result of over-allocation by the MDSHA and under-allocation from the WVDOH.

According to Table E2, for phase 1, the MDSHA is responsible for \$65,462,873, however the MDSHA has allocated \$71,312,000 (see table 12). For phase 1A, the MDSHA is responsible for \$12,894,234, however the MDSHA has allocated \$13,000,000 (see table 13). Therefore, the MDSHA has committed all of its share of estimated funding needed for construction of Phase 1 and Phase 1A (in year of expenditure dollars – see Table 11). The MDSHA over-allocation is \$5,954,893.

According to Table E2, the WVDOH is responsible for \$46,879,236 for phase 1 however current allocation by the WVDOH is \$39,100,000 (see table 12). As per the MOU, the WVDOH is currently contributing \$38 million for construction and \$1 million for detailed engineering of breakout Phase 1. The WVDOH portion of the work is outside the scope of the MDSHA I-81 NEPA document. Since West Virginia's NEPA document is not subject to the FHWA Major Project requirement, the WVDOH is not required to add funding commitment to the year of expenditure cost estimate. Although these agreed funding amounts in the MOU yields an apparent under-allocation of funding, it is not considered a financing issue, as the MDSHA and the WVDOH have entered into an MOU (See Appendix B) stipulating the WVDOH will be responsible for any cost increase related to their portion of the work. Therefore, the MOU accounts for the additional funding commitments necessary to cover for the current under-allocations. WVDOH is under-allocation is \$7,779,236. Therefore the net under-allocation is  $\$7,779,236 - \$5,954,893 = \$1,824,343 \sim \$1.8$  million.



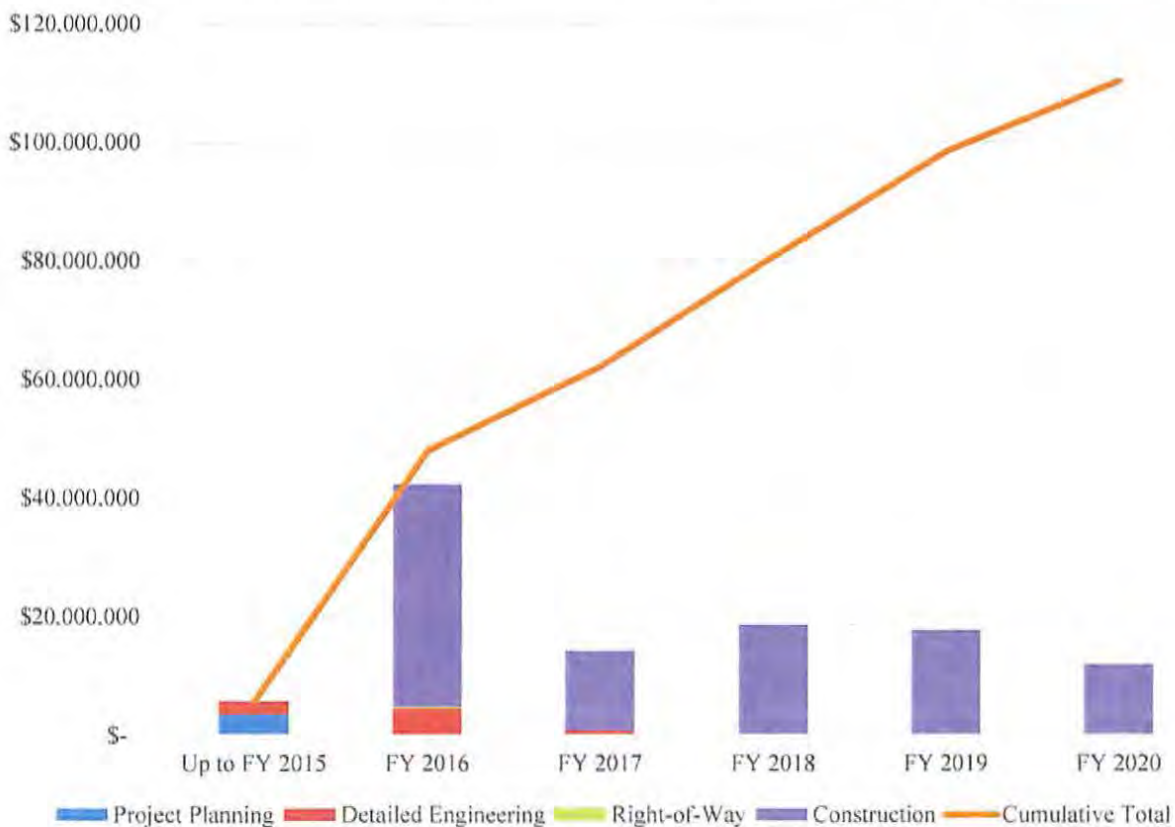
## SECTION 6 – PROJECT CASH FLOW

The MDSHA publishes cash flows at the beginning of the First Quarter - Draft Maryland Consolidated Transportation Program budget, and Third Quarter - Final draft Maryland Consolidated Transportation Program budget for the public. The MDSHA developed the project cash flows for Phase 1 and Phase 1A breakout projects as shown on table 14 and 15 and the charts below.

**Table 14: Phase 1 Cash Flow**

Fiscal Year	Project Planning	Detailed Engineering	Right-of-Way	Construction	Total	Cumulative Total
<b>Up to FY 2015</b>	\$3,517,000	\$2,213,000			\$5,730,000	\$5,730,000
<b>FY 2016</b>		\$4,504,000	\$250,000	\$37,500,000 <sup>a</sup>	\$42,254,000	\$47,984,000
<b>FY 2017</b>		\$700,000		\$13,477,000	\$14,177,000	\$62,161,000
<b>FY 2018</b>				\$18,621,000	\$18,621,000	\$80,782,000
<b>FY 2019</b>				\$17,716,000	\$17,716,000	\$98,498,000
<b>FY 2020</b>				\$11,914,000	\$11,914,000	\$110,412,000
<b>Total</b>	<b>\$3,517,000</b>	<b>\$7,417,000</b>	<b>\$250,000</b>	<b>\$99,228,000</b>	<b>\$ 110,412,000</b>	<b>\$110,412,000</b>

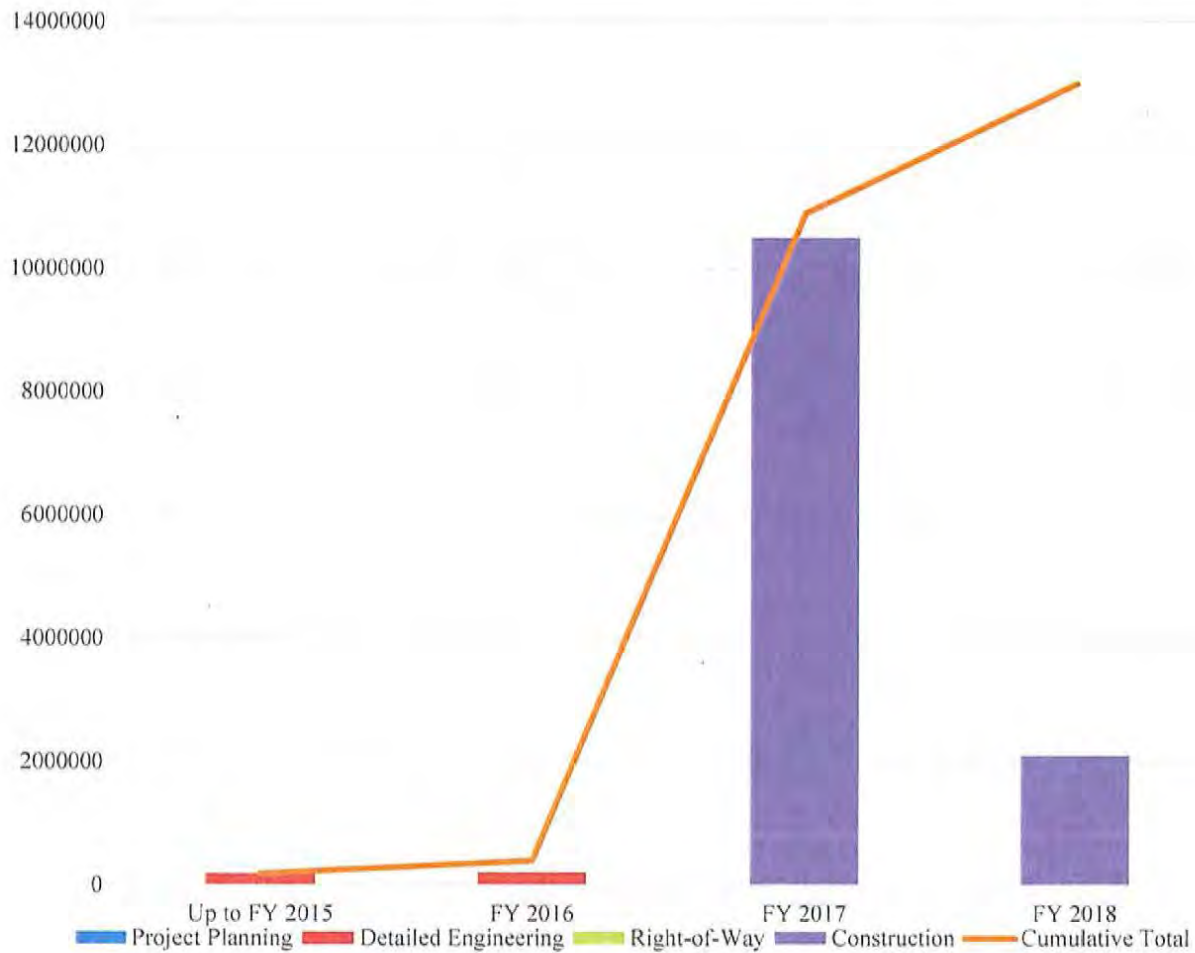
<sup>a</sup> The HEPMPO approved FY 2017-2020 TIP shows committed funding of \$37,500,000 for construction. Funding allocations in West Virginia were shown on the HEPMPO approved 2017-2020 TIP as prior year allocations



**Figure 17: Phase 1 Cash Flows**

**Table 15: Phase 1A Cash Flow**

Fiscal Year	Project Planning	Detailed Engineering	Right-of-Way	Construction	Total	Cumulative Total
Up to FY 2015		\$191,000			\$191,000	\$191,000
FY 2016		\$209,000			\$209,000	\$400,000
FY 2017				\$10,500,000	\$10,500,000	\$10,900,000
FY 2018				\$2,100,000	\$2,100,000	\$13,000,000
Total		\$400,000		\$12,600,000	\$ 13,000,000	\$13,000,000



**Figure 18: Phase 1A Cash Flows**

## **SECTION 7 – PUBLIC PRIVATE PARTNERSHIP (P3) ASSESSMENT**

The legislative authority for the Maryland Department of Transportation (MDOT) and its modal administrations, including the Maryland State Highway Administration (MDSHA), for Public-Private Partnerships (P3), was signed on April 9, 2013 and became effective on July 1, 2013. This law allows solicited proposals and unsolicited proposals for competitive solicitation, outlines key requirements for the competitive solicitation process, defines reporting requirements, and outlines key terms and provisions that should be part of a P3 agreement.

As one of the MDOT modal administrations, the MDSHA is developing a formalized process to assess the appropriateness of a P3 to deliver a project. The conceptual process begins with an internal assessment of the appropriateness of the P3 project delivery method for the particular project. This initial assessment will determine if P3 is not an appropriate project delivery method for the project or if a detailed assessment should be performed. A project that is not determined to be an appropriate candidate for a detailed assessment would go through a determination at the appropriate time to determine the most beneficial project delivery method (Design-Bid-Build, Design-Build, Construction Management at Risk). For a project that is determined to be appropriate for a detailed assessment, one will be performed to develop the necessary information and documentation to submit a concept application to the Transportation P3 Steering Committee to perform a High-Level Screening, and ultimately follow the requirements defined in the Code of Maryland Regulations.

Several different P3 project delivery methods may be applied to finance the unfunded breakout projects. A private partner may provide funding for design and construction as well as for operation and maintenance.

Tolling concessions options that a potential partner could use include tolling I-81 between MD 63 and the Pennsylvania state line include the following: all hours for all vehicles, during peak hours for all vehicles, truck tolling all hours, truck tolling during peak hours, or tolling the new third lane either at all times or peak hours only. The Phase 1 breakout project is already funded for construction and is not applicable for this P3 process. The MDSHA did propose tolls for the whole I-81 corridor in 2004 but this was dropped in July 2005 after many objections from residents and government officials in the Washington County.

Instead of toll concessions, Shallow Tolling could also be used where the private partner is paid based on each vehicle that uses the facility, and availability payments, where the contractor will receive a payment based on the availability of the facility at a certain performance level. Availability payments can be combined with the above tolling concession options or as a substitute to tolling.

The remaining I-81 phases can also be partially funded using the P3 method by having major businesses and other stakeholders along the corridor help contribute to the financing of this project. In exchange, major tax breaks could be given to the participating businesses. Another model to fund I-81 is to use the Design-Build-Finance Method, where the contractor designs and builds the roadway (as it is done already in Maryland) but also provides funding for it that would

be repaid in about six years. This would allow the project to be completed sooner and the MDSHA would have to pay for the project at a later date.

If the breakout projects Phase 2, 3, and 4 are not funded within the next six years, one option for the MDSHA for project financing could be a Design-Build-Finance model. This model would allow the MDSHA to get an upfront payment to begin work. Additionally, the MDSHA may consider using the availability method without tolling. However, a potential drawback of this method could be that the MDSHA would have to give up control on maintenance and operations of the I-81 segments for the time period that would be negotiated in the contract with the private partner.

## **SECTION 8 – RISKS AND RESPONSE STRATEGIES**

Typically, the Maryland State Highway Administration (MDSHA) will not move forward with the advertisement of a project for design, construction until all funding is secured for the project.

### **RISKS**

Phases 1& 1A are both in the final stage of design. It will be advertised for construction in Spring 2016. Phases 2- 4 have been on hold since 2010, after project planning was completed. The MDSHA developed a Risk Register (See Appendix C) based on risk impact cost, schedule, and risk probability. See Table 16 below for a summary of key risks with the funded breakout projects.

**Table 16: Summary of Key Risks**

<b>Risk Item</b>	<b>Description</b>
<b>Scope/Design Change during Construction</b>	Unknown field conditions could require design changes in the field. Any changes resulting in lengthy delays could have significant impacts to the construction schedule, as the Potomac River has stream-use restrictions which creates a narrow construction window for in-stream activities such as constructing cofferdams and pile driving. Karst topography is prevalent in Washington County. While several efforts have been made to locate these areas, there is a risk that once excavation begins, voids may become apparent causing work to be delayed until the caverns are filled and stabilized before work can resume.
<b>Material Availability</b>	The pavement surface being used for this project is a Gap-graded mix. Last summer, with the influx of state funds from Maryland's Investment in Highways and Bridges legislation, construction stone available for Gap-graded mix was in shortage.
<b>Contractor Availability</b>	A limited number of contractors are currently able to perform paving activities for the project. With several major projects on the horizon in 2016 and beyond, there is a risk that there may be more work than available contractors. If the same contractors bid and win these contracts, there may be a chance that all of the work cannot be completed in the time specified.
<b>Labor Shortage</b>	While contractors are looking for workers to add to their workforce, they are experiencing potential hires who may be unqualified or unreliable. The lack of unqualified workers is affecting the contractors' efforts to increase their ability to perform work.
<b>Market Condition</b>	Unforeseen increases in fuel costs could also impact the cost of materials, delivery, and the cost of machinery operation.



## RESPONSE STRATEGIES

If the MDSHA encounters any changes to the financial profile of the project due to the risks noted above, there are one or more risk mitigation strategies that could be implemented to offset those changes. The following Exhibit 4.3 summarizes the risk mitigation strategies available to the project sponsors.

**Table 17: Summary of Mitigation Strategies**

<b>Risk Item</b>	<b>Description</b>
<b>Scope/Design Change during Construction</b>	The MDSHA will address any scope or design changes during construction via change orders. As part of the standard change order process, the MDSHA will adjust additional costs and construction time as necessary. The MDSHA has accounted for this contingency as a four percent change order allowance within the cost estimate.
<b>Material Availability</b>	The MDSHA has communicated to construction stone producers to increase production to prepare for the influx of paving projects.
<b>Contractor Availability</b>	The MDSHA has communicated to potential contractors by sharing information on upcoming projects through the MDSHA's internet portal and eMaryland marketplace.
<b>Labor Shortage</b>	With advance knowledge of the upcoming projects and use of federal training grants on construction contracts, MDSHA and our contractors should be able to train workers on-the-job, and prepare for any labor shortages.
<b>Market Condition</b>	The construction bid items include a pay item for Fuel Price Adjustment. This item will cover for any unforeseen fuel price changes.

As the project cost and schedule changes due to any of the risk factors discussed in this section this Financial Plan will need to be updated. For the schedule of update of this document, refer to the next section.

## **SECTION 9 – ANNUAL UPDATE CYCLE**

This Initial Financial Plan reports previous expenditure as of the state fiscal year 2015, a partial fiscal year 2016 expenditure up to March 15, 2016, and also planned expenditures up to fiscal year 2020. The state fiscal year begins on July 1 and ends on June 30.

To maintain consistency with the Maryland Department of Transportation's Consolidated Transportation Program cycle, the MDSHA will be updating this financial plan on an annual basis each year until the following year of final construction closeout and payment. Annual financial numbers will reflect the date on the new Project Information Fact (PIF) sheet included in the Consolidated Transportation Program. The date of the PIF sheet will be December 1, with the annual update of the financial plan to be submitted on or before March 1 of the following year from the PIF. The first update will be dated December 1, 2016, with the update submitted to FHWA on or before March 1, 2017.

## **APPENDICES**

**APPENDIX A  
PRE-CER COST ESTIMATES**

**I-81 Improvement Project  
Initial Financial Plan**

**Table A – Summary of the Pre-CER Cost Estimate (2016\$)**

<b>Project Phase</b>	<b>Costs-to-Date</b>	<b>Costs-to-Complete</b>	<b>Total Costs</b>
1	\$8,738,000 <sup>1</sup>	\$90,548,304	\$99,286,304
1A	\$400,000	\$10,540,623	\$10,940,623
<b>Subtotal Funded</b>	<b>\$9,138,000</b>	<b>\$101,088,927</b>	<b>\$110,226,927</b>
2		\$114,305,825	\$114,305,825
3		\$131,571,905	\$131,571,905
4		\$212,875,475	\$212,875,475
<b>Total</b>	<b>\$9,138,000</b>	<b>\$559,842,132</b>	<b>\$568,980,132</b>

<sup>1</sup>Phase 1 Previous Expenditure (Costs-to-Date) - This figure includes \$3,514,000 for project planning by Maryland, \$125,000 for project planning by West Virginia, and \$5,099,000 for detailed engineering.

After MDSHA adjustments, the Pre-CER Total Cost Estimate (2016\$) decreased from \$568,980,132 to \$563,429,226 (see Section 3-Table 7).

**I-81 Improvement Project  
Initial Financial Plan**

**Table B – Details of the MDSHA Corrected Pre-CER Total Cost Estimate (2016\$)**

Project Planning Pre-CER Cost						
Breakout Projects	Phase 1		Phase 2	Phase 3	Phase 4	Total
Length	1.57		2.57	3.01	4.87	12.02
Percentage	13.1%		21.4%	25.0%	40.5%	100%
Project Planning Cost	Maryland Total	\$459,375		\$3,057,625		\$3,517,000
	Maryland Breakout Cost	\$459,375	\$0	\$751,971	\$880,713	\$1,424,941
	West Virginia Total	\$125,000				\$125,000
	Total	\$584,375		\$751,971	\$880,713	\$1,424,941
						\$3,642,000
Detailed Engineering Pre-CER Cost						
	FUNDED		UNFUNDED			Total
Breakout Projects	Phase 1	Phase 1A	Phase 2	Phase 3	Phase 4	
Length			2.57	3.01	4.87	10.45
Percentage			24.6%	28.8%	46.6%	100%
Detailed Engineering Cost	Maryland Total	\$3,810,000		\$59,162,244		\$62,972,244
	Maryland Breakout Cost	\$3,410,000	\$400,000	\$14,549,949	\$17,040,990.97	\$27,571,304.32
	West Virginia Total	\$1,000,000				\$1,000,000
	Total	\$4,410,000	\$400,000	\$14,549,949	\$17,040,991	\$27,571,304
						\$63,972,244
Right-of-Way Pre-CER Cost						
	FUNDED		UNFUNDED			Total
Breakout Projects	Phase 1	Phase 1A	Phase 2	Phase 3	Phase 4	
Length			2.57	3.01	4.87	10.45
Percentage			24.6%	28.8%	46.6%	100%
Right-of-Way	Maryland Total	\$10,995		\$9,818,994		\$9,829,989
	Maryland Breakout Cost	\$10,995	\$0	\$2,414,815	\$2,828,246	\$4,575,933
	West Virginia Total	\$4,005				\$4,005
	Total	\$15,000		\$2,414,815	\$2,828,246	\$4,575,933
						\$9,833,994
Construction Pre-CER Cost						
	FUNDED		UNFUNDED			Total
Breakout Projects	Phase 1	Phase 1A	Phase 2	Phase 3	Phase 4	
Length			2.57	3.01	4.87	10.45
Percentage			24.6%	28.8%	46.6%	100%
Construction Cost	Maryland Total	\$61,165,931		\$384,892,060		\$446,057,992
	Maryland Breakout Cost	\$51,952,100	\$10,540,623	\$94,657,665	\$110,863,646	\$179,370,750
	West Virginia Total	\$38,596,204				\$38,596,204
	Total	\$90,548,304	\$10,540,623	\$94,657,665	\$110,863,646	\$179,370,750
						\$485,980,987
Total Pre-CER Project Cost						
	FUNDED		UNFUNDED			Total
Breakout Projects	Phase 1	Phase 1A	Phase 2	Phase 3	Phase 4	
Total Project Cost	Maryland Total	\$65,446,301		\$456,930,924		\$522,377,225
	Maryland Breakout Cost	\$55,832,470	\$10,940,623	\$112,374,399	\$131,613,596	\$212,942,928
	West Virginia Total	\$39,725,209				\$39,725,209
	Total	\$95,557,679	\$10,940,623	\$112,374,399	\$131,613,596	\$212,942,928
	Total Funded Breakout Cost	\$106,498,302				

After MDSHA adjustments, the Pre-CER Total Cost Estimate (2016\$) decreased from \$568,980,132 (see Appendix A - Table A) to \$563,429,226 (see Section 3 - Table 7).

## I-81 Improvement Project Initial Financial Plan

**Table C – Details of the MDSHA Corrected Pre-CER Total Cost Estimate (2016\$) Adjusted with Change Order Allowance**

Milestone			Funded Phases			Total Funded Cost			Unfunded Phases			Total Unfunded Cost	Total Cost
			Phase 1		Phase 1A				Phase2	Phase3	Phase4		
			MD	WV	MD				MD	MD	MD		
Project Planning			\$459,375	\$125,000	\$0	\$459,375	\$125,000	\$584,375	\$751,971	\$880,713	\$1,424,941	\$3,057,625	\$3,642,000
Detailed Engineering			\$3,410,000	\$1,000,000	\$400,000	\$3,810,000	\$1,000,000	\$4,810,000	\$14,549,949	\$17,040,991	\$27,571,304	\$59,162,244	\$63,972,244
Right-of-Way			\$10,995	\$4,005	\$0	\$10,995	\$4,005	\$15,000	\$2,414,815	\$2,828,246	\$4,575,933	\$9,818,994	\$9,833,994
Construction	Neat Construction Cost		\$45,058,196	\$33,474,591	\$9,213,831	\$54,272,027	\$33,474,591	\$87,746,619	\$82,096,847	\$96,152,338	\$155,568,733	\$333,817,919	\$421,564,537
	Overhead		\$6,893,904	\$5,121,612	\$1,326,792	\$8,220,696	\$5,121,612	\$13,342,308	\$12,560,818	\$14,711,308	\$23,802,016	\$51,074,142	\$64,416,450
	Subtotal		\$51,952,100	\$38,596,204	\$10,540,623	\$62,492,723	\$38,596,204	\$101,088,927	\$94,657,665	\$110,863,646	\$179,370,750	\$384,892,060	\$485,980,987
	Change Order Allowance (4%)		\$2,078,084	\$1,543,848	\$421,625	\$2,499,709	\$1,543,848	\$4,043,557	\$3,786,307	\$4,434,546	\$7,174,830	\$15,395,682	\$19,439,239
	Total		\$54,030,184	\$40,140,052	\$10,962,247	\$64,992,432	\$40,140,052	\$105,132,484	\$98,443,971	\$115,298,192	\$186,545,580	\$400,287,743	\$505,420,227
Total	Pre CER Cost	State Cost	\$55,832,470	\$39,725,209	\$10,940,623	\$66,773,093	\$39,725,209	\$106,498,302	\$112,374,399	\$131,613,596	\$212,942,928	\$456,930,924	\$563,429,226
		Total	\$95,557,679										
	CY Cost	State Cost	\$57,910,554	\$41,269,057	\$11,362,247	\$69,272,802	\$41,269,057	\$110,541,859	\$116,160,706	\$136,048,142	\$220,117,758	\$472,326,606	\$582,868,465
		Total	\$99,179,612										

**I-81 Improvement Project  
Initial Financial Plan**

**Table D – Funded and Unfunded Breakout Projects Pre-CER Cost Ratios**

**MDSHA Funded and Unfunded Breakout Project Pre-CER Cost Ratios**

Project Type		Funded		Unfunded			Total
Breakout Projects		Phase 1		Phase 2	Phase 3	Phase 4	
States		MD	WV	MD	MD	MD	
Project Planning Ratio for Funded and Unfunded Breakout Projects							
Length		1.57		2.57	3.01	4.87	12.02
Ratio		13.1%		21.4%	25.0%	40.5%	100%
Detailed Engineering, Right-of-Way and Construction Cost Ratio After Breakout Unfunded Project Phases							
Ratios	Length			2.57	3.01	4.87	10.45
	Detailed Engineering						
	Right-of-Way			24.6%	28.8%	46.6%	100%
	Construction Cost						

**MDSHA Funded Breakout Project Pre-CER Cost Ratios**

Breakout Projects		Phase 1		Phase 1A	Total
States		MD	WV		
Current Year	Right-of-Way	\$10,995	\$4,005	\$0	\$15,000
	Construction	\$54,030,184	\$40,140,052	\$10,962,247	\$105,132,484
	Total	\$54,041,179	\$40,144,057	\$10,962,247	\$105,147,484
Ratios	Right-of-Way	0.01%	0.00%	0.00%	100%
	Construction	51.4%	38.2%	10.4%	

**MDSHA Unfunded Breakout Project Pre-CER Cost Ratios**

Breakout Projects		Phase 2	Phase 3	Phase 4	Total
Current Year Cost	Detailed Engineering	\$14,549,949	\$17,040,991	\$27,571,304	\$59,162,244
	Right-of-Way	\$2,414,815	\$2,828,246	\$4,575,933	\$9,818,994
	Construction	\$98,443,971	\$115,298,192	\$186,545,580	\$400,287,743
	Total	\$115,408,735	\$135,167,429	\$218,692,817	\$469,268,981
Ratios	Detailed Engineering	3.1%	3.6%	5.9%	100%
	Right-of-Way	0.5%	0.6%	1.0%	
	Construction	21.0%	24.6%	39.8%	

**Table E – Inflation Rates**

Years	Inflation Rate
2017	4%
2018	4%
2019	3.25%
2020	3%
2021	3%
2022-2034	2%



**I-81 Improvement Project  
Initial Financial Plan**

**Table E1 – Details of Year of Expenditure Cost Estimate for Funded and Unfunded Phases  
(Derivation of Costs)**

Funded Breakout Projects 70% Year of Expenditure Costs					
Breakout Projects		Phase 1		Phase 1A	Total
States		MD	WV	MD	
Ratios	Right of Way	0.01%	0.00%	0.00%	100%
	Construction	51.4%	38.2%	10.4%	
Total Project Cost		\$125,236,344			
Sum of Project Planning and Detailed Engineering Cost		\$5,394,375			
Sum of Right-of-Way and Construction Cost		\$119,841,968			
YOE Cost	Right of Way	\$12,532	\$4,565	\$0	\$17,096
	Construction	\$61,580,966	\$45,749,672	\$12,494,234	\$119,824,872
	Total	\$61,593,498	\$45,754,236	\$12,494,234	\$119,841,968
Unfunded Breakout Projects 20% Year of Expenditure Costs					
Breakout Projects		Phase 2	Phase 3	Phase 4	Total
States		MD	MD	MD	
Ratios	Detailed Engineering	3.1%	3.6%	5.9%	100%
	Right of Way	0.5%	0.6%	1.0%	
	Construction	21.0%	24.6%	39.8%	
Total Project Cost		\$628,689,667			
Project Planning Cost		\$3,057,625			
Sum of Detailed Engineering, Right of-Way and Construction Cost		\$625,632,042			
Current Year Cost	Detailed Engineering	\$19,398,074	\$22,719,145	\$36,758,218	\$78,875,437
	Right of Way	\$3,219,445	\$3,770,634	\$6,100,660	\$13,090,738
	Construction	\$131,246,055	\$153,716,197	\$248,703,615	\$533,665,867
	Total	\$153,863,574	\$180,205,976	\$291,562,492	\$625,632,042
Unfunded Breakout Projects 80% Year of Expenditure Costs					
Breakout Projects		Phase 2	Phase 3	Phase 4	Total
States		MD	MD	MD	
Ratios	Detailed Engineering	3.1%	3.6%	5.9%	100%
	Right of Way	0.5%	0.6%	1.0%	
	Construction	21.0%	24.6%	39.8%	
Total Project Cost		\$697,580,531			
Project Planning Cost		\$3,057,625			
Sum of Detailed Engineering, Right of-Way and Construction Cost		\$694,522,906			
Current Year Cost	Detailed Engineering	\$21,534,074	\$25,220,841	\$40,805,813	\$87,560,729
	Right of Way	\$3,573,951	\$4,185,833	\$6,772,428	\$14,532,212
	Construction	\$145,698,087	\$170,642,507	\$276,089,372	\$592,429,966
	Total	\$170,806,112	\$200,049,182	\$323,667,613	\$694,522,906

**I-81 Improvement Project  
Initial Financial Plan**

**Table E2 – Details of Year of Expenditure Cost Estimate for 70% YOES Funded and 20% YOES Unfunded Breakouts**

Milestone	Funded Phases			Total Funded Cost			Unfunded Phases			Total Unfunded Cost	Total Cost
	Phase 1		Phase 1A	MD	WV	Total	Phase 2	Phase 3	Phase 4		
	MD	WV	MD				MD	MD	MD		
Project Planning	\$459,375	\$125,000	\$0	\$459,375	\$125,000	\$584,375	\$751,971	\$880,713	\$1,424,941	\$3,057,625	\$3,642,000
Detailed Engineering	\$3,410,000	\$1,000,000	\$400,000	\$3,810,000	\$1,000,000	\$4,810,000	\$19,398,074	\$22,719,145	\$36,758,218	\$78,875,437	\$83,685,437
Right-of-Way	\$12,532	\$4,565	\$0	\$12,532	\$4,565	\$17,096	\$3,219,445	\$3,770,634	\$6,100,660	\$13,090,738	\$13,107,834
Construction	\$61,580,966	\$45,749,672	\$12,494,234	\$74,075,201	\$45,749,672	\$119,824,872	\$131,246,055	\$153,716,197	\$248,703,615	\$533,665,867	\$653,490,739
Total	\$65,462,873	\$46,879,236	\$12,894,234	\$78,357,107	\$46,879,236	\$125,236,344	\$154,615,545	\$181,086,689	\$292,987,433	\$628,689,667	\$753,926,010

**Table E3 – Details of Year of Expenditure Cost Estimate for 70% YOES Funded and 80% YOES Unfunded Breakouts**

Milestone	Funded Phases			Total Funded Cost			Unfunded Phases			Total Unfunded Cost	Total Cost
	Phase 1		Phase 1A	MD	WV	Total	Phase 2	Phase 3	Phase 4		
	MD	WV	MD				MD	MD	MD		
Project Planning	\$459,375	\$125,000	\$0	\$459,375	\$125,000	\$584,375	\$751,971	\$880,713	\$1,424,941	\$3,057,625	\$3,642,000
Detailed Engineering	\$3,410,000	\$1,000,000	\$400,000	\$3,810,000	\$1,000,000	\$4,810,000	\$21,534,074	\$25,220,841	\$40,805,813	\$87,560,729	\$92,370,729
Right-of-Way	\$12,532	\$4,565	\$0	\$12,532	\$4,565	\$17,096	\$3,573,951	\$4,185,833	\$6,772,428	\$14,532,212	\$14,549,308
Construction	\$61,580,966	\$45,749,672	\$12,494,234	\$74,075,201	\$45,749,672	\$119,824,872	\$145,698,087	\$170,642,507	\$276,089,372	\$592,429,966	\$712,254,838
Total	\$65,462,873	\$46,879,236	\$12,894,234	\$78,357,107	\$46,879,236	\$125,236,344	\$171,558,083	\$200,929,895	\$325,092,554	\$697,580,531	\$822,816,875

**APPENDIX B**  
**PHASE 1 MEMORANDUM OF UNDERSTANDING (MOU)**

## MEMORANDUM OF UNDERSTANDING

I- 81 Bridges Over the Potomac River and Adjacent Roadways Widening

by and between

**THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION-DIVISION OF  
HIGHWAYS**

and

**THE STATE HIGHWAY ADMINISTRATION OF THE MARYLAND DEPARTMENT OF  
TRANSPORTATION**

**THIS MEMORANDUM OF UNDERSTANDING ("MOU")**, executed in duplicate, made and entered into this 6<sup>th</sup> day MAY, 2016, by and between the State Highway Administration of the Maryland Department of Transportation, acting for and on behalf of the State of Maryland, hereinafter called "**MDSHA**," and the West Virginia Department of Transportation, Division of Highways, acting for and on behalf of the State of West Virginia, hereinafter called "**WVDOH**." When used collectively, **MDSHA** and **WVDOH** will be referred to as the "**PARTIES**".

**WHEREAS**, I-81 (Maryland Veterans Memorial Highway) is part of the National System of Interstate and Defense Highways and serves as a major trade and commerce highway route between the areas of western Maryland and the Eastern Panhandle of West Virginia; and

**WHEREAS**, there are two parallel bridge spans for MDSHA Bridge No. 21078 that cross the Potomac River and a portion of the C&O Canal Historic Park; on each span traffic is running in the opposite direction from the other, and the two parallel bridge spans are jointly owned by MDSHA and WVDOH (Log Mile Reference 0.000 – 0.230), with MDSHA being the lead agency for the maintenance, repair and reconstruction of both of the bridge spans, collectively called the "**BRIDGES**"; and

**WHEREAS**, as determined by the actual State boundary line ("**BOUNDARY LINE**") established by and agreed to by the PARTIES, MDSHA is responsible for seventy three and three tenths percent (73.3%) ("**MDSHA BRIDGES OBLIGATION**") and WVDOH is responsible for twenty six and seven tenths percent (26.7%) ("**WVDOH BRIDGES OBLIGATION**") of the BRIDGES as regards maintenance, repair and reconstruction costs as outlined in an Agreement executed on July 20, 1960 ("**AGREEMENT**") ("**EXHIBIT Number 1**") and Supplemental Agreement executed on November 26, 1963 ("**SUPPLEMENT**") ("**EXHIBIT Number 2**") between the PARTIES. The AGREEMENT and the SUPPLEMENT are attached hereto and incorporated herein as **EXHIBIT Number 1** and **EXHIBIT Number 2** respectively; and

**WHEREAS**, the PARTIES now desire to widen the BRIDGES and to widen the roadways that approach the BRIDGES in each direction by the addition of a third lane in each direction of I-81: from the southern end of the BRIDGES to a point north of US 11 (Westernport Pike) in WV ("**WVDOH ROADWAY**") and from the northern end of the BRIDGES to a point north of the MD 63 (Potomac Street)/MD 68 (Conococheaque Street) interchange in Maryland ("**MDSHA**



**ROADWAY”)** under State Highway Administration Contract No.WA3445272, hereinafter collectively called the **“PROJECT”**; and

**WHEREAS**, with the execution of this MOU the LOC entered between the PARTIES, dated January 17, 2014 is null and void; and

**WHEREAS**, WVDOH shall be responsible for one hundred percent (100%) of all design and construction costs to widen the WVDOH ROADWAY and MDSHA shall be responsible for one hundred percent (100%) of all design and construction costs to widen the MDSHA ROADWAY; and

**WHEREAS**, the cost to design the WVDOH’s portion of the PROJECT, which includes the WVDOH BRIDGES OBLIGATION and the WVDOH ROADWAY is currently estimated to be One Million Dollars (\$1,000,000) and the construction costs to construct the WVDOH portion of the PROJECT, including the same areas, is currently estimated to be Thirty Eight Million Dollars (\$38,000,000); and

**WHEREAS**, the cost to design the MDSHA’s portion of the PROJECT, which includes the MDSHA BRIDGES OBLIGATION and the MDSHA ROADWAY is currently estimated to be Three Million Dollars (\$3,000,000) and the construction costs to construct the WVDOH portion of the PROJECT, including the same areas, is currently estimated to be Fifty Million Dollars (\$50,000,000); and

**WHEREAS**, the above referenced design and construction costs are only estimates, and WVDOH agrees to pay all of the actual design and construction costs including MDSHA’s direct salaries, payroll burden, overhead, consultant and construction engineering services costs as outlined in this MOU for the WVDOH portion of the PROJECT; and

**WHEREAS**, MDSHA has agreed to design and construct the PROJECT; and

**WHEREAS**, the PARTIES agree that all costs incurred for WVDOH’s portion of the PROJECT as stated herein shall be paid in full by WVDOH and shall be incurred at WVDOH’s sole cost; and

**WHEREAS**, MDSHA and WVDOH agree that this MOU will benefit both PARTIES hereto and will promote the safety, health and general welfare of the citizens of both States.

**NOW, THEREFORE, THIS MOU WITNESSETH**, that for and in consideration of the mutual promises and other good and valuable considerations contained herein, the receipt and adequacy whereof is hereby acknowledged, be it understood that MDSHA and WVDOH do hereby agree as follows:

## **I. PROJECT DESCRIPTION**

- A. The PROJECT shall consist of the widening of the I-81 BRIDGES over the Potomac River and over a portion of the C&O Canal Historic Park, including additional roadway widening and other improvements along I-81 that joins I-81 to the BRIDGES in Maryland and in West Virginia.

1. BRIDGES

- a. One additional lane and one shoulder will be added to each of the two BRIDGE spans in both the northbound and southbound directions over the Potomac River and over a portion of the C&O Canal Historic Park.
- b. By agreement between the PARTIES regarding the cost obligations for the PROJECT, pursuant to the BOUNDARY LINE, MDSHA shall be responsible for seventy three and three tenths percent (73.3%) of the maintenance, repair, reconstruction and widening of the BRIDGES (**"MDSHA BRIDGES OBLIGATION"**) and WVDOH shall be responsible for twenty six and seven tenths percent (26.7%) of the maintenance, repair, reconstruction and widening of the BRIDGES (**"WVDOH BRIDGES OBLIGATION"**) as regards design, maintenance, and reconstruction costs.

2. ROADWAY WIDENING AND OTHER IMPROVEMENTS IN MARYLAND

- a. I-81 from the northern end of the BRIDGES to a point north of the MD 63/MD 68 interchange in Maryland will also be widened so as to add a third lane in each direction (**"MDSHA ROADWAY"**).
- b. The widening of the BRIDGES that is MDSHA BRIDGES OBLIGATION, together with the roadway widening associated with the MDSHA ROADWAY is collectively called the **"MDSHA PORTION"**.

3. ROADWAY WIDENING AND OTHER IMPROVEMENTS IN WEST VIRGINIA

- a. I-81 from the southern end of the BRIDGES to a point north of the US 11 interchange in West Virginia will also be widened so as to add a third lane in each direction (**"WVDOH ROADWAY"**).
- b. The widening of the BRIDGES that is WVDOH BRIDGES OBLIGATION, together with the roadway widening associated with the WVDOH ROADWAY is collectively called the **"WVDOH PORTION"**.

II. PROJECT DESIGN PHASE

A. MDSHA Responsibilities

- 1. MDSHA shall accomplish all tasks necessary to design the PROJECT.

2. Transmittals shall be defined as all necessary reproducible construction drawings, special provisions (referencing all relevant codes, regulations and requirements) estimates, lists of materials and all pertinent items requested for the PROJECT, or any revisions thereto, hereinafter referred to as **"TRANSMITTALS"**.
3. MDSHA or its consultants shall incorporate the WVDOH PORTION of the PROJECT and all pertinent items necessary for the WVDOH PORTION of the PROJECT into the PROJECT plans.
4. MDSHA shall provide WVDOH with four (4) sets of the PROJECT plans at each phase of the design process, and/or as required by the previous permit review correspondence for its review and comment, and MDSHA shall retain sole authority for approvals. The design phase shall consist of (i) preliminary design at thirty percent (30%) completion, (ii) semifinal design at sixty-five percent (65%) completion, (iii) final design review at ninety-five percent (95%) completion, and (iv) Plans, Specifications, and Estimates (PS&E) at one hundred percent (100%) completion.
5. In the event that MDSHA desires to revise the PROJECT plans subsequent to final plan approval, but prior to initiation of construction activities, and said revision(s) affect the BRIDGES and/or the WVDOH ROADWAY, MDSHA shall provide WVDOH with written notification of said revision(s), including estimated costs.

**B. WVDOH Responsibilities**

1. WVDOH or its consultant shall prepare and furnish all necessary WVDOH TRANSMITTALS requested by MDSHA for the WVDOH PORTION of the PROJECT.
2. WVDOH shall provide MDSHA with written review comments on all PROJECT plans, data or materials provided by MDSHA for review within fifteen (15) working days following the WVDOH receipt of the items sent for review.
3. Within fifteen (15) working days of the request by MDSHA for review, WVDOH shall provide MDSHA with any and all requested information and data that WVDOH may have that will assist MDSHA in the design of the PROJECT.
4. In the event WVDOH desires to revise the plans for the BRIDGES and/or WVDOH ROADWAY subsequent to final plan approval, but prior to initiation of construction activities, WVDOH shall provide MDSHA with written notification of the proposed revision(s). Any costs for the proposed revision(s) submitted by WVDOH shall be paid for solely by WVDOH. WVDOH shall promptly increase or decrease its funding appropriations for such revisions, if and as necessary, in accordance with this MOU.

### III. DESIGN PHASE FUNDING

#### A. MDSHA Responsibilities

1. MDSHA shall be responsible for all costs to design the MDSHA PORTION of the PROJECT, which are: (i) one hundred percent (100%) of the design costs for the MDSHA ROADWAY, (ii) seventy three and three tenths percent (73.3%) of the design cost for the I-81 BRIDGES, and of the costs to lease the land along the south side of the Potomac River in West Virginia on land that is owned by Allegheny Energy Supply Co. ("AESC") and which will be used as an access route and a staging area primarily to support the construction of the BRIDGES ("AESC LANDS").
2. MDSHA shall provide a detailed invoice to WVDOH on a periodic basis for all costs incurred by MDSHA for all design activities related to the WVDOH PORTION of the PROJECT, including, but not limited to, MDSHA's construction engineering services, direct salaries and payroll burden and other direct costs for consultant services, reproduction, and document preparation, and indirect costs to include, but not limited to MDSHA's overhead and direct costs. The invoice shall be accompanied by sufficient documentation to evidence all actual costs incurred.

#### B. WVDOH Responsibilities

1. WVDOH will reimburse MDSHA, its agents, consultants, etc. for one hundred percent (100%) of the design costs (plus applicable MDSHA salaries, payroll burdens and overhead) for the WVDOH PORTION of the PROJECT, including twenty six and seven tenths percent (26.7%) of the design costs to construct the BRIDGES and of the costs for the staging area in West Virginia from January 17, 2014 until the WVDOH accepts the WVDOH PORTION of the PROJECT for maintenance.
2. WVDOH is responsible for all costs associated with the design of the WVDOH PORTION of the PROJECT.
3. The total amount to be reimbursed to MDSHA by WVDOH for the design of the WVDOH PORTION of the PROJECT under this MOU is currently estimated to be One Million Dollars (\$1,000,000). The final cost, which could be higher or lower, will be determined by the sum of the final design costs, consultant services, construction activities and items based on bid prices, conditions encountered during construction, MDSHA's direct salaries, payroll burden and overhead incurred during the design and construction of the WVDOH PORTION of the PROJECT. WVDOH agrees that it shall pay all such costs.
4. WVDOH shall reimburse MDSHA within thirty (30) days of its receipt of an invoice for payment for all undisputed items in each invoice for actual costs incurred by MDSHA, or its agents, for the design of the WVDOH PORTION of the PROJECT. (For any disputed invoice see Section VII. E.)



5. If WVDOH does not make timely payments of undisputed documented design related invoices submitted by MDSHA to WVDOH as provided herein, MDSHA shall, at its sole discretion and after providing thirty (30) days prior written notice to WVDOH of WVDOH's unpaid invoices, send all delinquent invoices for collection to MDSHA's Central Collection Unit ("CCU") which is located at:

Maryland Department of Management and Budget  
300 West Preston Street, First Floor  
Baltimore, MD 21201

Phone: 410-767-1220 or 1-888-248-0345

Email: [ask.ccu@maryland.gov](mailto:ask.ccu@maryland.gov)

6. WVDOH hereby agrees that it shall reimburse MDSHA for one hundred percent (100%) of all utility relocation design costs associated with the construction of the WVDOH PORTION of the PROJECT.
7. At WVDOH's sole cost, WVDOH shall review the PROJECT design plans and related materials provided for that purpose and shall provide written comments to MDSHA within fifteen (15) working days following receipt thereof.
8. In the event WVDOH desires to revise the WVDOH PORTION of the PROJECT's design plans subsequent to final plan approval, but prior to initiation of construction activities, WVDOH shall provide MDSHA with a written request of said revision including estimated costs, for MDSHA to incorporate into the plans for the PROJECT.

#### IV. RIGHT-OF-WAY PHASE

##### A. MDSHA Responsibilities

1. In accordance with MDSHA's standard procedures and all applicable Federal and State laws regarding same, and as part of the PROJECT requirements, MDSHA shall accomplish all tasks necessary to acquire, at MDSHA's expense, the property interests required for the MDSHA PORTION of the PROJECT including, but not limited to all easements (e.g. construction, drainage, etc.), rights-of-entry and fee simple property acquisitions, such tasks to include, but not be limited to, title examinations and reports, appraisals, appraisal reviews, plat preparation, negotiation services, possible condemnation proceedings and settlements.

##### B. WVDOH Responsibilities

1. In accordance with WVDOH standard procedures and all applicable Federal and State laws regarding same, and as part of the PROJECT requirements, WVDOH shall accomplish all tasks necessary to acquire, at WVDOH's expense and in WVDOH's name, all the property interests required for the construction of the WVDOH PORTION of the PROJECT, including, but not

limited to all easements (e.g. construction, drainage, etc.), rights-of-entry and fee simple property acquisitions, such tasks to include, but not be limited to, title examinations and reports, appraisals, appraisal reviews, plat preparation, negotiation services, possible condemnation proceedings and settlements.

2. By execution of this MOU, WVDOH hereby grants a right-of-entry onto all WVDOH owned property or other WVDOH property interests needed along and adjacent to I-81 to MD, its agents, successors, consultants, assigns, contractors, sub-contractors, and employees for the purposes involved with the design and/or construction of PROJECT, with such right-of-entry to terminate upon completion and acceptance of the PROJECT by MDSHA and WVDOH, or at such other period that is mutually agreed upon by the PARTIES.
3. WVDOH will acquire all of the required rights-of-way needed by contract plans to construct the WVDOH PORTION of the PROJECT and WVDOH shall acquire any and all permits that are required by the plans, or MDSHA's agents, required to design and construct the WVDOH PORTION of the PROJECT at WVDOH's sole expense.
4. WVDOH will lease the land area specified by MDSHA along the south side of the Potomac River on land that is owned by AESC that is to be used as an access route and a staging area primarily to support the construction of the BRIDGES ("AESC LANDS").
5. WVDOH, by execution of this MOU, provides a right of entry to MDSHA and its contractors, consultants, and assigns onto WVDOH owned lands, rights-of-way, and other property for use as a temporary easement or staging area or to construct the PROJECT as specified by MDSHA and agreed upon by WVDOH.

## **V. RIGHT-OF-WAY PHASE FUNDING**

### **A. MDSHA Responsibilities**

1. In the event additional property interests (e.g., right-of-entry, easements, fee simple) are needed for the construction of the PROJECT, MDSHA shall cover the costs only for the tasks necessary to acquire such property interests for the MDSHA PORTION of the PROJECT.
2. MDSHA shall not fund any costs related to the acquisition of property interest in West Virginia for the WVDOH PORTION of the PROJECT, with the exception that MDSHA will reimburse WVDOH for Seventy Three and Three Tenths Percent (73.3%) of the cost to lease the AESC LANDS.

### **B. WVDOH Responsibilities**

1. WVDOH shall be responsible for all costs incurred by WVDOH in granting a right-of-entry to MDSHA, its agents, successors, assigns, contractors, sub-contractors, and employees for the purpose of constructing the PROJECT.
  - a. The only exception to this pertains to the acquisition of the staging area in West Virginia, along the south side of the Potomac River on AESC LANDS that is to be used as a staging area primarily to support the construction of the BRIDGES. To lease the AESC LANDS, MDSHA will pay for 73.3% percent of the costs to rent the staging area and WVDOH will pay 26.7% percent of the cost to rent the staging area from AESC. WVDOH will take the lead in leasing the property from AESC for the AESC LANDS.
  - b. The cost to lease the AESC LANDS for a three (3) year period is Fifteen Thousand Dollars (\$15,000). WVDOH and MDSHA will be responsible for its respective share of the lease cost that corresponds to WVDOH's and MDSHA's BRIDGES OBLIGATION. In the event that the lease time requires an extension and/or additional cost is required to maintain the lease due to a time extension, the PARTIES shall mutually agree as the parameters.
2. WVDOH shall not fund any property interest in MDSHA for the MDSHA PORTION of the PROJECT.

## **VI. CONSTRUCTION PHASE**

### **A. MDSHA Responsibilities**

1. MDSHA shall advertise the PROJECT for construction bids, administer the construction contract, construct the PROJECT as shown on the final PROJECT plans and provide construction engineering services for the PROJECT.
2. Contractors hired by MDSHA will have comply with WVDOH's specification on WVDOH roadways and WVDOH's insurance requirements such as naming WVDOH as an additional insured and indemnify and hold harmless WVDOH.
3. MDSHA shall obtain all permits necessary to construct the MDSHA PORTION of the PROJECT.
4. MDSHA shall be the principal construction manager for the PROJECT with responsibility for total PROJECT oversight and for conducting all monthly progress meetings. MDSHA shall notify WVDOH in writing of all progress meetings for WVDOH PORTION of the PROJECT ten (10) business days prior to the meeting date. At WVDOH's cost, a WVDOH representative

may attend all such meetings so that WVDOH may be cognizant of the PROJECT's progress, any anticipated changes, and possible cost overruns.

5. At WVDOH's sole cost, WVDOH may provide inspectors for the construction of the WVDOH PORTION of the PROJECT. WVDOH inspectors shall conduct inspections in accordance with the construction and work schedule of MDSHA's PROJECT Manager or designee, assigned to manage the construction of the PROJECT. Any significant defect or irregularity attributable to MDSHA's contractor (other than those which can be corrected on the site following notification from MDSHA's PROJECT Engineer) shall be corrected by MDSHA's contractor after MDSHA has received written notification from WVDOH of such defect or irregularity; notification must occur prior to the release of funds to the contractor for work performed on the PROJECT.
6. In the event that revisions to the PROJECT are required due to conditions encountered during construction, said revisions may be made promptly by MDSHA for MDSHA ROADWAY without prior concurrence by WVDOH, and said revisions may be made promptly by WVDOH for WVDOH ROADWAY without prior concurrence by MDSHA, and any revision to the BRIDGES must be agreed to by both Parties in order to minimize or eliminate possible delay claims by MDSHA's construction contractor. MDSHA shall promptly provide WVDOH with a written description of all revisions and WVDOH shall be responsible for all undisputed costs attributed in any way to the WVDOH PORTION of the PROJECT.
7. In the event utility relocations are required to construct the PROJECT, MDSHA shall oversee and facilitate all utility relocations for the construction of the MDSHA portion of PROJECT to be performed by the utility company with the cost responsibilities being determined by Maryland Utility Prior Rights laws.
8. Following completion of the PROJECT, MDSHA shall make a final accounting of actual design and construction costs incurred by MDSHA that are attributable to the WVDOH PORTION of the PROJECT.
9. MDSHA shall be responsible for providing a schedule for all road and/or lane closures that will be necessary during construction to complete the PROJECT and for completing the maintenance of traffic plan which will ultimately be used during construction of the PROJECT. Further, MDSHA shall work with WVDOH to complete all requirements relating to the closure of the roads and/or travel lanes, including, without limitation, all advertising or notification requirements.

10. Upon completion of the construction of the PROJECT, MDSHA and WVDOH will jointly perform a final inspection of all work related to the WVDOH PORTION of the PROJECT. If defects or deficiencies are noted, WVDOH shall provide written notice of the defects and deficiencies to MDSHA no later than ten (10) working days after such final inspection and include a "punch list" of the defects and deficiencies requiring correction. MDSHA shall require MDSHA's contractor to correct said defects and deficiencies and MDSHA and WVDOH shall again jointly inspect those items listed on the "punch list" developed by WVDOH. Upon the satisfactory completion of the work related to WVDOH PORTION of the PROJECT and within fifteen (15) working days of final inspection of the corrected "punch list" items, WVDOH shall provide written notice to inform MDSHA that the work related to WVDOH PORTION of the PROJECT is satisfactory, and WVDOH shall accept the WVDOH PORTION of the PROJECT for ownership and maintenance. MDSHA will provide WVDOH with a final invoice at that time, which shall be prior to MDSHA releasing any retained funds for the completion of the PROJECT to MDSHA's contractor.
11. Commencing on the date that MDSHA executes the final plan approval of the PROJECT's design plans and continuing until the date that the WVDOH PORTION of the PROJECT has been constructed and found acceptable to WVDOH and to MDSHA, MDSHA agrees to provide WVDOH with quarterly progress reports and quarterly cost reports. The progress reports shall include progress curves and percentage completion calculations for WVDOH PORTION of the PROJECT based upon the PROJECT Schedule. The quarterly cost reports shall document all work performed in connection with the WVDOH PORTION of the PROJECT, identify costs paid in connection with the WVDOH PORTION of the PROJECT, and forecast the total costs necessary to complete the WVDOH PORTION of the PROJECT after considering all approved and pending changes to the design plan and remaining contingencies.
12. Within ninety (90) days after completion and acceptance of the WVDOH PORTION of the PROJECT, MDSHA shall provide WVDOH with two (2) sets of As Built drawings, at WVDOH's expense, showing field changes for the WVDOH PORTION of the PROJECT.

B. WVDOH Responsibilities

1. WVDOH shall obtain all permits for MDSHA that are necessary for MDSHA to construct the WVDOH PORTION of the PROJECT.



2. In the event WVDOH desires to make revisions to the BRIDGES and/or the WVDOH ROADWAY portion of the PROJECT subsequent to final plan approval and/or during construction, it shall promptly submit a request in writing to MDSHA, including the requested revisions and the estimated costs. WVDOH agrees that any additional costs incurred by, or charged to MDSHA to implement WVDOH requested revisions for the WVDOH portion of the PROJECT shall be the sole responsibility of WVDOH.
3. WVDOH, at its option and expense, may provide an inspector during construction of the PROJECT. If WVDOH elects to exercise this option, MDSHA's PROJECT inspectors shall consult with the WVDOH inspector prior to finalizing construction decisions which affect WVDOH PORTION of the PROJECT (i.e. the BRIDGES and the WVDOH ROADWAY), whenever such consultation is appropriate and does not create a delay claim situation or *is not an emergency*. MDSHA's PROJECT inspectors shall have final authority during construction for the MDSHA ROADWAY and WVDOH's PROJECT inspectors shall have final authority during construction for the WVDOH ROADWAY; however, the inspectors of both Parties must agree prior to finalizing construction decisions which affect the BRIDGES.
4. WVDOH shall, in the event of deficiencies for the WVDOH PORTION of the PROJECT observed during the joint MDSHA and WVDOH final inspection for the WVDOH PORTION of the PROJECT, notify MDSHA in writing no more than ten (10) working days after the final inspection and include a list of deficiencies requiring correction. MDSHA shall require MDSHA's contractor to correct said defects and deficiencies and MDSHA and WVDOH shall again jointly inspect those items listed on the "punch list" developed by WVDOH. Upon the satisfactory completion of the work related to WVDOH PORTION of the PROJECT and within fifteen (15) working days of final inspection of the corrected "punch list" items, WVDOH shall provide written notice to inform MDSHA that the work related to WVDOH PORTION of the PROJECT is satisfactory, and WVDOH shall accept the WVDOH PORTION of the PROJECT for ownership and maintenance.
5. WVDOH shall be responsible for all WVDOH inspections, materials and specialized tie-in connection services performed or provided by WVDOH for the WVDOH PORTION of the PROJECT.
6. WVDOH shall be responsible for, in addition to actual construction costs of the WVDOH PORTION of the PROJECT, MDSHA's administrative and general costs and overhead, construction engineering services, direct salaries and payroll burden associated with the WVDOH PORTION of the PROJECT.

7. WVDOH agrees to permit MDSHA to utilize WVDOH owned rights-of-way or any other WVDOH property interests needed for access, staging area, and for the construction of the PROJECT.

## **VII. CONSTRUCTION PHASE FUNDING**

- A. The total amount to be reimbursed to MDSHA by WVDOH for the construction of the WVDOH PORTION of the PROJECT is currently estimated to be Thirty Eight Million Dollars (\$38,000,000) (**"INITIAL CONSTRUCTION COSTS"**). The final cost, which could be higher or lower, will be determined by the sum of final design costs, construction activities and items based on bid prices, conditions encountered during construction, MDSHA's direct salaries, payroll burden and overhead incurred during the construction of the WVDOH PORTION of the PROJECT. WVDOH agrees that it shall pay all such costs (**"WVDOH CONSTRUCTION COSTS"**).
- B. In the event that MDSHA determines that the costs to construct the WVDOH PORTION will exceed the estimate of Thirty Eight Million Dollars (\$38,000,000), MDSHA will promptly notify WVDOH in writing, providing details as to the revised Construction Cost Estimate for the WVDOH PORTION of the PROJECT and the reason for the estimated cost increase. Upon notification from MDSHA that WVDOH's reimbursement obligation to MDSHA for the WVDOH PORTION may exceed or is approaching the limits of the Construction Cost Estimate, WVDOH shall immediately either (i) allocate additional funding for the WVDOH PORTION so as not to delay MDSHA's construction contractor or (ii) revise the scope of work for the WVDOH PORTION in order to stay within WVDOH's current allocations. However, in the case of option (ii) above, WVDOH shall be solely responsible for all resulting costs incurred by MDSHA and caused by redline revisions resulting from (ii). WVDOH reserves the right to review the documentation supporting any invoices and/or cost increases presented to WVDOH by MDSHA.
- C. MDSHA shall provide WVDOH with a copy of the final public solicitation bid package for the PROJECT, including all addenda thereto. Upon receipt of the bid results, MDSHA shall provide WVDOH with the resulting bid tabulation report for the WVDOH PORTION of the PROJECT. WVDOH shall issue a contract release order for payment for the construction costs to MDSHA for the WVDOH PORTION of the PROJECT.
- D. If the contractor's bid for the WVDOH PORTION of the PROJECT exceeds the INITIAL CONSTRUCTION COSTS, WVDOH shall immediately (i) allocate additional funding for the WVDOH PORTION so as not to delay MDSHA's construction contractor, or (ii) revise the scope of work for the WVDOH PORTION to stay within WVDOH's current allocations. However, in the case of (ii) above, WVDOH shall be solely responsible for all resulting costs incurred by MDSHA caused by redline revisions resulting from (ii). Once WVDOH has selected either (i) or (ii) above, MDSHA shall award the PROJECT contract, in its sole discretion, but in accordance with WVDOH's selection.

- E.** In the event WVDOT disputes any billings from MDSHA, WVDOT may withhold payment only for the disputed item(s). Within thirty (30) days of WVDOT's receipt of MDSHA's invoice accompanied by sufficient supporting documentation for such work, WVDOT shall meet with MDSHA to resolve the disputed item(s). At said meeting, MDSHA and WVDOT shall use good faith efforts to resolve all disputed item(s). Disputed item(s) not resolved within such time period shall be referred to MDSHA's District Engineer and the WVDOT contact listed in Section IX. M. of this MOU, for resolution. MDSHA and WVDOT agree to meet to resolve disputed items within sixty (60) days of WVDOT providing notice to MDSHA. Items not resolved within sixty (60) days shall be referred to the MDSHA's Deputy Administrator/Chief Engineer for Operations and WVDOT's Deputy Secretary for Highway for resolution.
- F.** All disputed invoiced item(s) shall be settled prior to MDSHA's final payment to MDSHA's contractor for the PROJECT.
- G.** MDSHA shall provide WVDOT with periodic invoices accompanied by supporting documentation to substantiate costs for the PROJECT based on MDSHA's contractor's cost estimates/progress billings, plus any additional costs and overhead as applicable for that period. Within thirty (30) days of WVDOT's receipt of each periodic invoice, WVDOT shall: (i) pay each periodic invoice submitted by MDSHA upon receipt, or (ii) provide a written dispute to MDSHA for the periodic invoice. Should WVDOT reasonably request additional documentation, MDSHA shall promptly provide WVDOT with the requested documentation, if available. MDSHA shall make all payments to MDSHA's contractor in a timely manner for all items of work that have been successfully performed and completed in accordance with the PROJECT contract, except in the case of items that are disputed by WVDOT.
- H.** In the event WVDOT does not make timely payments of undisputed documented construction related invoices submitted by MDSHA to WVDOT as provided herein, MDSHA shall, at its sole discretion and after providing thirty (30) days prior written notice to WVDOT's contact designated in Section IX. M., send all delinquent invoices for collection to MDSHA's Central Collection Unit ("CCU") which is located at:

Maryland Department of Management and Budget  
300 West Preston Street, First Floor  
Baltimore, MD 21201

Phone: 410-767-1220 or 1-888-248-0345  
Email: [ask.ccu@maryland.gov](mailto:ask.ccu@maryland.gov)

## VIII. MAINTENANCE RESPONSIBILITIES

- A. Upon completion of the construction of the PROJECT, the MDSHA ROADWAY portion of the PROJECT shall be owned and maintained by MDSHA.
- B. Upon completion of construction of the PROJECT, the WVDOH ROADWAY portion of the PROJECT shall be owned and maintained by WVDOH.
- C. Upon completion of the construction of the PROJECT, the BRIDGES shall be jointly owned by MDSHA and WVDOH, and maintained by MDSHA as outlined in **Exhibit Number 1** and **Exhibit Number 2**.

## IX. GENERAL

- A. The recitals (WHEREAS clauses) are incorporated herein as a substantive part of this MOU.
- B. The parties hereby warrant and affirm that the persons executing this MOU on its respective behalf are authorized and empowered to act on behalf of the respective parties.
- C. Whenever the approval of MDSHA or WVDOH is required under this MOU, such approval will not be unreasonably withheld, conditioned or delayed.
- D. The parties hereto agree to cooperate with each other to accomplish the terms and conditions of this MOU.
- E. This MOU shall inure to the benefit of and be binding upon the parties hereto, their agents, successors, and assigns.
- F. Except as otherwise specifically provided, no amendment or modification of this MOU is valid unless the same is in writing and signed by each party to this MOU.
- G. MDSHA shall not be liable for any obligation, act, or omission that is the responsibility of WVDOH, its contractors, employees, consultants, assigns, or its agents hereunder.
- H. WVDOH shall not be liable for any obligation, act, or omission that is the responsibility of MDSHA, its contractors, employees, consultants, assigns, or its agents hereunder.
- I. This MOU and any WVDOH issued permit does not grant or create for MDSHA any interest in the real property of West Virginia.
- J. All MDSHA invoices shall be accompanied by sufficient documentation by MDSHA to evidence actual costs incurred. If WVDOH requires additional

documentation, WVDOH may have WVDOH authorized personnel visit MDSHA to verify all documentation and to conduct independent audits. WVDOH is to contact:

Ms. Carmella Ezekwe, Chief  
Accounts Receivable  
Office of Finance  
Maryland State Highway Administration  
Mail Stop C-504  
707 N. Calvert Street  
Baltimore, MD 21202  
Phone: 410-545-5745  
Email: [cezekwe@sha.state.md.us](mailto:cezekwe@sha.state.md.us)

K. All notices and/or invoices shall be addressed:

If to the WVDOH:

Paul A. Mattox, Jr., P.E.  
Secretary of Transportation – Commissioner of Highways  
West Virginia Department of Transportation  
Building Five, Room 110  
1900 Kanawha Boulevard  
Charleston, WV 25305-0430  
Phone (304)558-3505  
Fax (304)558-1004  
Email [dot.commissioner@wv.gov](mailto:dot.commissioner@wv.gov)

R.J. Scites, P.E.  
Director of Engineering Division  
West Virginia Division of Highways  
1334 Smith Street  
Charleston, WV 25305  
Phone: 304-558-2885  
Email: [Raymond.J.Scites@wv.gov](mailto:Raymond.J.Scites@wv.gov)

If to MDSHA:

Mr. Anthony Crawford  
District Engineer  
State Highway Administration  
1250 Vocke Road  
La Vale, MD 21502  
Phone: 301 729-8486  
Fax: 301-729-6968  
E-mail: [acrawford@sha.state.md.us](mailto:acrawford@sha.state.md.us)



If to MDSHA Office of Structures:

Mr. Earle S. Freedman  
Director – Office of Structures  
Maryland State Highway Administration  
707 N. Calvert Street, MS C-203  
Baltimore, MD 21202  
Phone: 410-545-8060  
Email: [efreedman@sha.state.md.us](mailto:efreedman@sha.state.md.us)

with a copy of all correspondence to:

SHA Agreements Team  
Office of Procurement and Contract Management  
State Highway Administration  
707 N. Calvert Street, Mailstop C-405  
Baltimore MD 21202  
Phone: 410-545-0437  
Fax: 410-209-5025  
E-Mail: [SHAAGreementsTeam@sha.state.md.us](mailto:SHAAGreementsTeam@sha.state.md.us)

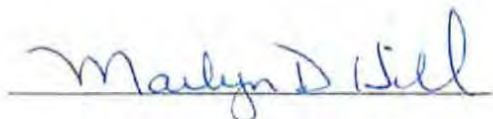
- N. All parties to this MOU shall comply with the requirements of **APPENDIX A** (2 pages) and **APPENDIX E** (1 page) of MDSHA's Standard Title VI/Non-Discrimination Assurances DOT Order No. 1050.2A which generally set forth non-discriminatory regulations and other civil rights related regulations. **APPENDIX A** and **APPENDIX E** are attached hereto and incorporated herein as substantive parts of this document.

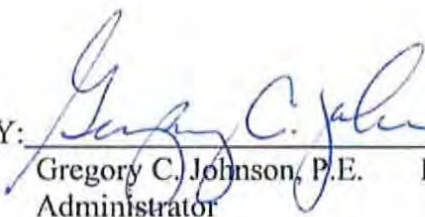
**(The remainder of this page is intentionally left blank.)**

IN WITNESS WHEREOF, the parties hereto have caused this MEMORANDUM OF UNDERSTANDING to be executed by their proper and duly authorized officers, on the day and year first above written.

**MARYLAND STATE HIGHWAY  
ADMINISTRATION**

WITNESS:




BY:  5/6/2016 (SEAL)  
Gregory C. Johnson, P.E. Date  
Administrator


**APPROVED AS TO FORM AND  
LEGAL SUFFICIENCY:**


  
Libby C. Rappaport  
Assistant Attorney General


**RECOMMENDED FOR APPROVAL:**

  
David J. Coyne  
Deputy Administrator/Chief Engineer  
for Operations

  
Cheryl R. B. Hill  
Deputy Administrator for Administration

 5/4/16  
Earle S. Freedman  
Director  
Office of Structures

  
Gregory I. Slater  
Acting Deputy Administrator/Chief Engineer  
for Planning, Engineering, Real Estate and  
Environment

  
Lisa B. Conners  
Director  
Office of Finance

BAW  
Witness

THE STATE OF WEST VIRGINIA

BY: Earl Ray Tomblin (SEAL)  
Earl Ray Tomblin Date  
Governor 4/18/16



WEST VIRGINIA DEPARTMENT OF  
TRANSPORTATION

Paul A. Mattox, Jr.  
Paul A. Mattox, Jr., P.E.  
Secretary/Highways Commissioner  
West Virginia Department of  
Transportation/Division of Highways

APPROVED AS TO FORM AND  
LEGAL SUFFICIENCY:

\_\_\_\_\_  
Attorney

CB Mattox  
APPROVED AS TO FORM THIS  
14th DAY March, 2016  
ATTORNEY LEGAL DIVISION  
WEST VIRGINIA DEPARTMENT  
OF TRANSPORTATION  
DIVISION OF HIGHWAYS

160303

21078  
SUPPLEMENTAL AGREEMENT

THIS SUPPLEMENTAL AGREEMENT, Made this 24<sup>th</sup> day of November, 1963, between THE STATE ROAD COMMISSION OF WEST VIRGINIA, a corporation, hereinafter called "COMMISSION," and the STATE ROADS COMMISSION OF MARYLAND, acting for and on behalf of the State of Maryland, hereinafter called "ROADS COMMISSION,"

## W I T N E S S E T H:

WHEREAS, COMMISSION and ROADS COMMISSION entered into an agreement dated the 20th day of July, 1960, for the joint construction of a multi-lane highway bridge, on Interstate Route No. 81, over the Potomac River, approximately one mile down stream from Williamsport, Maryland, to connect Washington County, Maryland, with Berkeley County, West Virginia; and

WHEREAS, it was originally contemplated that ROADS COMMISSION would let to construction that portion of the project which included the driving of piling for the south abutment of the highway bridge; and

WHEREAS, it has now become desirable to include the driving of piling for the south abutment of said bridge in the approach contract to be let to construction by COMMISSION; and

WHEREAS, it has been determined that the division of responsibility for payment of construction and maintenance costs should be altered;

NOW, THEREFORE, in consideration of the mutual covenants hereinafter set forth, COMMISSION and ROAD COMMISSION agree as follows:

SECTION 1. COMMISSION will include the driving of the piling for the south abutment of the multi-lane highway approach contract. ROADS COMMISSION will reimburse COMMISSION its proportionate share of such work upon submission of proper invoice by COMMISSION.

SECTION 2. The division of payment for construction costs and routine maintenance costs between the two states, as set out in Sections 6 and 8 of the basic agreement, is altered to indicate COMMISSION'S responsibility at Twenty-six and seven tenths per cent (26.7%) and ROADS COMMISSION'S responsibility at Seventy-three and three tenths per cent (73.3%).

SECTION 3. ROADS COMMISSION agrees to assume the responsibility for routine maintenance as set forth in Section 8 of the original agreement.

IN WITNESS WHEREOF, the parties hereto have caused their respective names to be signed, and official seals hereunto affixed by their proper officers thereunto duly authorized as of the date hereof.

ATTEST:

THE STATE ROAD COMMISSION OF WEST VIRGINIA

*James M. Loring*  
Executive Secretary

By: *Burl G. Jarrow*  
Its Commissioner

APPROVED:

*W. W. B. B. B. B.*  
Governor of West Virginia

ATTEST:

STATE ROADS COMMISSION OF MARYLAND

*W. C. Dean*  
Secretary

By: *J. R. L.*  
Chairman & Director of Highways

APPROVED:

*W. C. Dean*  
Chief Engineer, State Roads  
Commission, Maryland

Approved as to form  
and legal sufficiency

*Nov. 12*  
*J. R. L.*  
Notary Public

Bridge No. 21078

SAC of MD Copy

Contract W-446-18-620  
F.A.P. No. I-81-1(100)0AGREEMENT

THIS AGREEMENT, executed in duplicate, made and entered into this 20<sup>TH</sup> day of July, 19 60, by and between the State Road Commission of West Virginia, by its Commissioner, acting for and on behalf of the State of West Virginia, hereinafter called "Commissioner", and the State Roads Commission of Maryland, acting for and on behalf of the State of Maryland, hereinafter called "Roads Commission", Witnesseth:

WHEREAS, Commissioner and Roads Commission contemplate construction of multiple lane highways in West Virginia and Maryland, known as Interstate Route #81, hereinafter called "Project" connecting Washington County, Maryland, with Berkeley County, West Virginia, by means of a multiple lane highway bridge over the Potomac River about one mile downstream from Williamsport, Maryland, and

WHEREAS, Preparation of Plans and Specifications or arranging therefor by the Roads Commission for "Project" is hereby authorized by Commissioner and Roads Commission as a joint project, and when said plans, etc., are approved, will become a part of this agreement by reference. It is understood that construction may be deferred until a later date as mutually agreed upon by the parties hereto, and

WHEREAS, "Project" is a part of the Interstate Highway #81 and Federal Aid Interstate Highway funds are to be used to defray Interstate portion of costs thereof, all in accordance with Federal Regulations, and

WHEREAS, Chapter 17, Article 4, Section 34 of the Code of West Virginia of 1955 and Section 7, Article 89B of the Annotated Code of Maryland, 1957, Edition, authorize the Commissioner and Roads Commission, respectively, to enter into an agreement for the proper construction and maintenance of the bridge.

NOW, THEREFORE, THIS AGREEMENT WITNESSETH, that for and in consideration of the premises, and the sum of \$1.00 payable by each party hereto to the other, the receipt whereof is hereby acknowledged, and in further consideration



21078

of the mutual covenants hereinafter set forth to be kept and performed, the parties hereto do hereby agree as follows:

SECTION 1. For the purposes of this Agreement, the boundary line between the State of West Virginia and Maryland is to be considered as Station 110+18, as shown on a plan prepared by Roads Commission and identified as General Plan and Elevation, dated August 11, 1959, Contract W-446-18-620.

SECTION 2. Also for the purposes of this Agreement, the following terms will have the meanings respectively ascribed to them in this Section, except in those instances where the context clearly indicates a different meaning:

- (1) Construction Costs - All costs incident to construction of the bridge, including all surveys, designs, plans, contract costs, engineering and overhead costs, but excluding surveys, right of way costs, plans of and construction necessary for approaches to the bridge.
- (2) Major Repairs - All major work in repairing or reconstructing the bridge substructure and superstructure, including painting below the roadway, but excluding routine maintenance as hereinafter defined.
- (3) Routine Maintenance - Ordinary and normal care and maintenance work, such as but not limited to snow removal, signing, traffic painting, placing of abrasives and chemicals, cleaning roadway and safety curb surfaces, repairing wearing surface of roadway and painting above deck, but excluding all major repairs as hereinabove defined. Furthermore, this agreement shall not apply to any type of maintenance on approach roads to the bridge, it being hereby agreed that each State will maintain, at its sole expense, its approach roads.

SECTION 3. Roads Commission shall prepare and cause to be prepared, all surveys, plans, specifications and estimates of costs for the new bridge-- all of which, or any revisions thereof are subject to the approval of the parties hereto.

Roads Commission and Commissioner shall obtain any permits for the crossing of Government owned lands, in their respective States, made necessary by the construction of the project.

SECTION 4. The Roads Commission will advertise the aforesaid work for construction and, in accordance with regular Commission procedure, receive bids for same. No contracts for the work shall be awarded without concurrence of Commissioner.

SECTION 5. Commissioner shall survey, prepare plats for, acquire and pay for all rights of way necessary for that portion of the bridge and approaches situated in West Virginia, and shall perform and pay for all costs and expenses of surveys, designs, plans and construction necessary for the West Virginia approach to the bridge. The Roads Commission shall survey, prepare plats for, acquire and pay for all rights of way necessary for that portion of the bridge and approaches situated in Maryland and shall perform and pay for all costs and expenses of surveys, designs, plans and construction necessary for the Maryland approach to the bridge.

SECTION 6. Division of payment of construction costs between the two states shall be based upon the ratio as the estimated cost of that part of the structure in each state bears to the estimated cost of the entire structure. Based upon preliminary cost estimates prepared by Roads Commission, it is hereby agreed that West Virginia is responsible for and shall pay thirty-three (33) per cent. of the construction costs and Maryland is responsible for and shall pay sixty-seven (67) per cent. of the construction costs.

SECTION      As aforesaid, Roads Commission will advertise, receive bids and make award, after concurrence by Commissioner, Roads Commission to furnish Commissioner with copy of all Plans, Specifications, Proposal Forms and other contract documents. Thereafter, Roads Commission will supervise construction of the Bridge Structure and handle and dispose of all details with contractor (s). Nothing herein shall deny Commissioner the right to place inspectors upon work performed in West Virginia and all such work is subject to approval by Commissioner. In case of any changes involving major revisions in plans or awarded cost, then Roads Commission will consult Commissioner, negotiate and arrive at decision mutually agreeable to both States. Roads Commission will pay contractor (s) under its usual current estimate basis, and accordingly submit and render invoices to Commissioner; and such invoices will be submitted at intervals of not less than thirty (30) days nor more than sixty (60) days. Said invoices will be for proper ratio of amounts paid contractor as described in Section 6. Commissioner agrees to reimburse Roads Commission within thirty (30) days of receipt thereof.

For surveys, engineering, overhead, and other proper and justifiable construction costs (excluding approaches) Roads Commission shall invoice Commissioner at proper ratio as described in Section 6; said billing to be at 90 days intervals, and Commissioner agrees to reimburse Roads Commission within thirty (30) days of receipt thereof.

In case of any engineering, overhead, and other proper and justifiable construction costs (excluding approaches) incurred by West Virginia, Commissioner shall invoice Roads Commission on basis of proper ratio of such as described in Section 6, and Roads Commission agrees to reimburse Commissioner within thirty (30) days of receipt thereof.

SECTION 8. Upon completion of the bridge and its acceptance by Commissioner and Roads Commission, "title to said bridge and the approaches thereto shall be vested ~~in~~ in the State of Maryland and the State of

West Virginia proportion to and in accordance with the boundary line between said States, as more particularly established and set forth in Section 1 of this Agreement, and upon such completion and acceptance," the Commissioner shall bear the costs of major repairs to the bridge, roadway, superstructure and substructure in West Virginia, and the Roads Commission shall bear the costs of major repairs to the bridge, roadway, superstructure and substructure in Maryland. For routine maintenance the division of cost thereof shall be on the basis of the ratio that the length of bridge in each state bears to the total length thereof and based upon the accepted plans for the bridge, responsibility for routine maintenance shall be thirty-three (33) per cent to West Virginia and sixty-seven (67) per cent to Maryland. Promptly upon acceptance of the structure by the two States, a plan for performance of and supervision of routine maintenance shall be discussed at a joint meeting of representatives of Commissioner and Roads Commission. This shall result in recommendation for handling routine maintenance to Commissioner and Roads Commission and after approval thereby shall result in one of the States assuming the total responsibility for such routine work as the selected State may be best suited or adapted by location and ~~disposal~~ of such State's equipment and personnel. Once selected and approved by Commissioner and Roads Commission, it shall continue in full force and effect until a subsequent possible re-distribution of material, maintenance equipment or maintenance shops location as would justify a change. Irrespective, however, of responsibility of routine maintenance the State performing the work shall be reimbursed by the other State at ratio set forth above. Invoices to be submitted at quarterly intervals and paid within 30 days after receipt thereof.

Commissioner shall perform all work and bear all costs of maintaining

approaches to the bridge in West Virginia. Roads Commission shall perform all work and bear all costs of maintenance on approaches to bridge in Maryland.

SECTION 9. The bridge shall not be discontinued, abandoned or disposed of without the consent of both the Commissioner and the Roads Commission. In the event the bridge shall be disposed of, the proceeds ~~received~~ from such disposal shall be distributed between the Commissioner and the Roads Commission in the same proportions as those borne by each in the costs of constructing the bridge.

SECTION 10. The terms and conditions of this agreement shall inure to and be binding upon the parties hereto, their successors, and assigns.

IN WITNESS WHEREOF the parties hereto have caused these presents to be executed in duplicate by their proper officers thereunto duly authorized the day and year first above written.

STATE ROAD COMMISSION OF WEST VIRGINIA

By P. B. Hanes  
Commissioner

ATTEST:

Bosley A. Boaz  
Executive Secretary

APPROVED:

S. P. Hudson  
Governor of West Virginia

O. K.  
LEGAL  
FORM &  
CONTENT  
6/15

STATE ROAD COMMISSION OF MARYLAND

By J. H. C.  
Chairman & Director of Highways

ATTEST:

C. P. Hanes  
Secretary

APPROVED:

Samuel H. Hanes  
Chief Engineer, State Roads  
Commission, Maryland

Approved as to form  
and legal sufficiency  
July 11 1961  
W. H. Hanes  
Special Road Attorney General



Martin O'Malley, Governor  
Anthony G. Brown, Lt. Governor

State Highway  
Administration

James F. Smith, Jr., Secretary  
Melinda B. Peters, Administrator

January 17, 2014

Subject: SHA Contract No.: WA344B21  
Description: Rehabilitation and Widening of Dual  
Bridge Nos. 21078 on I-81 over Potomac River and  
C&O Canal Historic Park

Mr. Paul A. Mattox, Jr., P.E.  
Secretary of Transportation – Commissioner of Highways  
West Virginia Department of Transportation  
1900 Kanawha Boulevard, Building Five, Room 110  
Charleston, West Virginia 25305-0430

RECEIVED  
FEB 03 2014  
ENGINEERING  
DIVISION

Dear Mr. Mattox:

We were recently contacted by Mr. Ali Sadeghian of your office regarding our joint project to widen and rehabilitate the existing dual bridges on I-81 over the Potomac River. At that time he discussed the project with Mr. John Narer of my staff and stated that the West Virginia Department of Highways would like us to give consideration to incorporating the widening of an additional section of I-81 south of the bridge crossing.

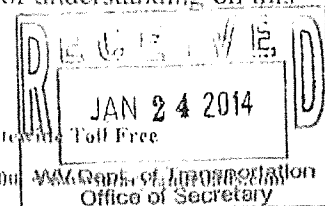
Specifically, Mr. Sadeghian stated that the West Virginia portion of I-81 approaching the bridge crossing had been recently widened to within a mile of our current project limits. This widening, coupled with the previously completed West Virginia roadway, provides for three through travel lanes in each direction for approximately 10 miles of I-81 from this point (1 mile +/- south of the Potomac River) southward through Martinsburg. At the completion of our jointly planned project, I-81 would be capable of accommodating three lanes of traffic in each direction from the I-81 interchange with Maryland 68/63 southward into West Virginia. The only exception would be the mile long section that is located between our jointly planned project and your recently completed project.

Mr. Ali Sadeghian questioned if we would be willing to include this additional section of widening within our project if the West Virginia Department of Highways was willing to assist in the project coordination and reimburse Maryland for all costs related to the design and construction of this additional section of I-81. We have discussed this issue internally with our management staff and concur with you that it makes sense to incorporate the additional widening into a single project. Therefore, we are willing to move forward with your request. Since we are both in accord with this direction, we will prepare a draft memorandum of understanding on this topic and forward it to you for your review and comments.

My telephone number/toll-free number is 410-545-8060

Maryland Relay Service for Impaired Hearing or Speech 1.800.735.2258 Statewide Toll Free

Street Address: 707 North Calvert Street • Baltimore, Maryland 21202 • Phone 410.545.0300





Mr. Paul A. Mattox

Page 2

We look forward to working with you on this project and moving forward with these badly needed bridge and roadway improvements. Should you wish to discuss this matter further please feel free to contact me at 410-545-8060 or our Project Manager John W. Narer at 410 545-8368 or [jnarer@sha.state.md.us](mailto:jnarer@sha.state.md.us) for further discussion.

Working together, the Shepardstown and Keyser/McCoole bridge projects turned out well, and we expect the same results at this location. West Virginia has always been a pleasure to work with on our joint projects. Please sign below indicating your concurrence and return to us as soon as possible so that we may initiate the design work for the third lane widening in West Virginia.

Very truly yours,

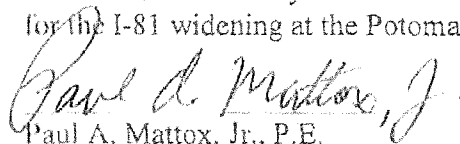


Earle S. Freedman, Director  
Office of Structures  
Maryland State Highway Administration

ESF:JWN  
Enclosures

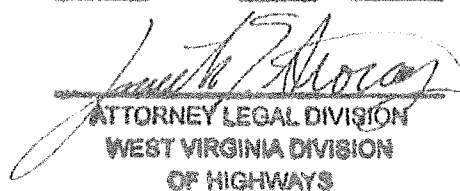
Cc: Doug Simmons  
Melinda Peters  
Anthony Crawford

Concur in reimbursing Maryland for all design and construction costs associated with the additional roadway work in West Virginia for the I-81 widening at the Potomac River



Paul A. Mattox, Jr., P.E.  
Commissioner of Highways  
West Virginia Department of  
Transportation

APPROVED AS TO FORM THIS  
29<sup>th</sup> DAY OF 1 20 14



ATTORNEY LEGAL DIVISION  
WEST VIRGINIA DIVISION  
OF HIGHWAYS

## APPENDIX A OF THE TITLE VI ASSURANCES

During the performance of this contract, the Contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the Contractor) agrees as follows:

1. Compliance with Regulations: The Contractor (hereinafter includes consultants) will comply with the Acts and the Regulations relative to Non-discrimination in Federally-assisted programs of the U.S. Department of Transportation, the Federal Highway Administration, as they may be amended from time to time, which are herein incorporated by reference and made a part of this contract.
2. Non-discrimination: The Contractor, with regard to the work performed by it during the contract, will not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The Contractor will not participate directly or indirectly in the discrimination prohibited by the Acts and the Regulations, including employment practices when the contract covers any activity, project, or program set forth in Appendix B of 49 CFR Part 21.
3. Solicitations for Subcontracts, Including Procurements of Materials and Equipment: In all solicitations, either by competitive bidding, or negotiation made by the Contractor for work to be performed under a subcontract, including procurements of materials, or leases of equipment, each potential subcontractor or supplier will be notified by the Contractor of the Contractor's obligations under this contract and the Acts and the Regulations relative to Non-discrimination on the grounds of race, color, or national origin.
4. Information and Reports: The Contractor will provide all information and reports required by the Acts, the Regulations, and directives issued pursuant thereto and will permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the Recipient or the Federal Highway Administration to be pertinent to ascertain compliance with such Acts, Regulations, and instructions. Where any information required of a Contractor is in the exclusive possession of another who fails or refuses to furnish the information, the Contractor will so certify to the Recipient or the Federal Highway Administration as appropriate, and will set forth what efforts it has made to obtain the information.
5. Sanctions for Noncompliance: In the event of a contractor's noncompliance with the Nondiscrimination provisions of this contract, the Recipient will impose such contract sanctions as it or the Federal Highway Administration may determine to be appropriate, including, but not limited to:
  - a. withholding payments to the Contractor under the contract until the Contractor complies; and/or
  - b. cancelling, terminating, or suspending a contract, in whole or in part.

6. Incorporation of Provisions: The Contractor will include the provisions of paragraphs one through six in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Acts, the Regulations and directives issued pursuant thereto. The Contractor will take action with respect to any subcontract or procurement as the Recipient or the Federal Highway Administration may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if the Contractor becomes involved in, or is threatened with litigation by a subcontractor, or supplier because of such direction, the Contractor may request the Recipient to enter into any litigation to protect the interests of the Recipient. In addition, the Contractor may request the United States to enter into the litigation to protect the interests of the United States.

**APPENDIX C  
PROJECT RISK SUMMARY TABLES**

Table 18: I-81 Phase 1 Risk Summary

I-81 IMPROVEMENT PROJECT RISK SUMMARY SECTION - PHASES I				
PROJECT No. WA3445272  Length (mi.): 1.57		Risk Register Key		
		Cost	Schedule	Probability
		5 - High (>\$50,000,000)	5 - High (>60 days)	5 - High (>60%)
		4 - Med (>\$20,000,000)	4 - Med (>30 days)	4 - Med. (>40%)
		3 - Low (>\$5,000,000)	3 - Low (>20 days)	3 - Low (>20%)
		2 - Very Low (>\$500,000)	2 - Very Low (>5 days)	2 - Very Low (>10%)
		1 - Ex. Low (<=\$500,000)	1 - Ex. Low (<=5 days)	1 -Ex. Low (<=10%)
Risk Item	Description	Risk Impact (Cost)	Risk Impact (Schedule)	Risk Probability
Bid Item Omission	If a bid item is missing a change order will need to be negotiated with the Contractor	1	1	4
Incorrect Quantities	If any quantity is incorrect, the item could either be over run or there could be an under run. If underrun by more than 25%, the Contractor could request re-negotiation of the price.	1	1	4
Scope/design changes during construction	Unknown field conditions could require design changes in the field. Any changes resulting in lengthy delays could have significant impacts to the construction schedule, as the Potomac River has stream-use restrictions which creates a narrow construction window for in-stream activities such as constructing cofferdams and pile driving.	Unknown	5	3
Other Risks	Drainage, Permits, Noise Walls, Landscaping, In stream wrok and some of West Virginia-funded work items	1	2	3

**I-81 Improvement Project  
Initial Financial Plan**

**Table 19: I-81 Phase 1A Risk Summary**

PROJECT No. WA2495176  Length (mi.): 0.57		Risk Register Key		
		Cost	Schedule	Probability
		5 - High (>\$50,000,000)	5 - High (>60 days)	5 - High (>60%)
		4 - Med (>\$20,000,000)	4 - Med (>30 days)	4 - Med (>40%)
		3 - Low (>\$5,000,000)	3 - Low (>20 days)	3 - Low (>20%)
		2 - Very Low (>\$500,000)	2 - Very Low (>5 days)	2 - Very Low (>10%)
		1 - Ex. Low (<=\$500,000)	1 - Ex. Low (<=5 days)	1 - Ex. Low (<=10%)
Risk Item	Description	Risk Impact (Cost)	Risk Impact (Schedule)	Risk Probability
Material availability	I-81 requires the HMA surface to be a GAP graded mix. Last summer, with the influx of state funds from Governor Hogan, there became a shortage of stone available for that type of mix. Therefore, I-81 NB from Halfway Blvd to the PA state line was not able to be paved. The producers of the stone were to increase production throughout the winter of 2016 to prepare for the influx of paving projects slated for the 2016 construction season.	4	4	4
Contractor Availability	A limited number of contractors are currently able to pave I-81 with the proper mix. With several major projects on the horizon in 2016 and beyond, there is a risk that there may be more work than available contractors. If the same contractors bid and win these contracts, there may be a chance that all of the work cannot be completed in the time specified.	4	4	4
Labor Shortage	While contractors are looking for workers to add to their workforce, they are experiencing issues of many being unqualified and others not being reliable. The lack of unqualified workers is affecting the contractors' efforts to increase their ability to perform work.	4	4	4
Topography	Karst topography is prevalent in Washington County. While several efforts have been to locate these areas, there is a risk that once excavation begins, voids may become apparent causing work to be delayed until the caverns are filled and stabilized before work can resume.	4	3	3
Market Condition	Unforeseen increases in fuel costs that could also impact the cost of materials, delivery, and the cost of machinery operation.	3	1	3
Unforeseen risks	There are unforeseen risks on natural and manmade disasters.	Unknown	Unknown	Unknown



Table 20: I-81 Phase 2-4 Risk Summary

PROJECT No. WA128 Location: Sta. 96+00 to Sta. 648+31 Length (mi.): 10.46		Risk Register Key		
		Cost	Schedule	Probability
		5 - High (>\$50,000,000)	5 - High (>60 days)	5 - High (>60%)
		4 - Med (>\$20,000,000)	4 - Med (>30 days)	4 - Med (>40%)
		3 - Low (>\$5,000,000)	3 - Low (>20 days)	3 - Low (>20%)
		2 - Very Low (>\$500,000)	2 - Very Low (>5 days)	2 - Very Low (>10%)
		1 - Ex. Low (<=\$500,000)	1 - Ex. Low (<=5 days)	1 - Ex. Low (<=10%)
Risk Item	Risk Description	Risk Impact (Cost)	Risk Impact (Schedule)	Risk Probability
Material cost and availability	I-81 requires the HMA surface to be a gap graded mix. With the influx of state funds, there became a shortage of stone available for that type of mix. There is a risk of under-production of stone for this HMA mix, which could increase the cost of HMA paving items.	4	4	4
Contract Availability	A limited number of contractors are currently able to pave I-81 with the proper mix. With several major projects on the horizon in 2016 and beyond, there is a risk that there may be more work than available contractors. If the same contractors bid and win these contracts, there may be a chance that all of the work cannot be completed in the time specified.	3	4	4
Market Conditions (Labor)	While contractors are looking for workers to add to their workforce, they are experiencing issues with many being unqualified and others not being reliable. The lack of unqualified workers is affecting the contractors' efforts to increase their ability to perform work.	2	2	3
Topography	Karst topography is prevalent in Washington County. While several efforts have been to locate these areas, there is a risk that once excavation begins, voids may become apparent causing work to be delayed until the caverns are filled and stabilized before work can resume.	3	5	4
Structure Sufficiency	Because there is chance that construction of subsequent phases may not begin for several years, many of the structures along the corridor may be in need of re-decking, substructure repairs, or replacement. This could significantly increase the cost of construction.	4	2	3
Land use changes	Land use changes could increase trip generation, deteriorate traffic flow, and ultimately increase land values. This could prompt a re-evaluation of the scope of any phases not constructed in the near future.	3	1	3
External Risks	New permits or additional information required, reviewing agency requires longer than expected review time, changes to stormwater requirements, permits or agency actions delayed or take longer than expected; New information required for permits; Environmental regulations change; Controversy on environmental grounds expected; Pressure to deliver project on an accelerated schedule; Labor shortage or strike; Construction or pile driving noise and vibration impacting adjacent businesses or residents.	4	4	4
Design Risks	Unresolved constructability items, incomplete quantity estimates; Unforeseen construction window; new or revised design standards made prior to these remaining phases reaching subsequent phases; Design changes to alignment, profile, typical cross section; unexpected environmental constraints that impact bridge construction; Unforeseen aesthetic requirements; Delay due to permits or agreements, from Federal, State, or local agencies for geotechnical subsurface exploration; Delay due to traffic management and lane closure for geotechnical subsurface exploration.	4	4	3
Constructability Risks	Subsurface utilities not previously surveyed and in conflict with construction activities; Street or ramp closures not coordinated with local community; Insufficient or limited construction or staging areas; Changes during construction requiring additional coordination with resource agencies; Bridge removal not correctly staged to accommodate traffic during removal activities.	2	3	3
Project Management Risks	Scope creep; Unresolved project conflicts not escalated in a timely manner; Unanticipated escalation in right of way values or construction cost; Delay in earlier project phases jeopardizes ability to meet programmed delivery commitment; Added workload or time requirements because of new direction, policy, or statute; Local agency support not attained; Unforeseen agreements required; Priorities change on existing program; Inconsistent cost, time, scope, and quality objectives.	2	5	2
Organizational Risks	Scope of work or schedule changes; Fiscal year funding changes; Capital funding unavailable for design, right of way and construction of remaining project phases.	4	5	4

**Table 21: I-81 Environment Risk Summary**

PROJECT No. WA128 Location: Sta. 96+00 to Sta. 648+31 Length (mi.): 10.46		Risk Register Key		
		Cost	Schedule	Probability
		5 - High (>\$5,000,000)	5 - High (>60 days)	5 - High (>60%)
		4 - Med (>\$2,000,000)	4 - Med (>30 days)	4 - Med. (>40%)
		3 - Low (>\$500,000)	3 - Low (>20 days)	3 - Low (>20%)
		2 - Very Low (>\$250,000)	2 - Very Low (>5 days)	2 - Very Low (>10%)
		1 - Ex. Low (<=\$250,000)	1 - Ex. Low (<=5 days)	1 - Ex. Low (<=10%)
Risk Item	Description	Risk Impact (Cost)	Risk Impact (Schedule)	Risk Probability
Supplemental NEPA Document	Future NEPA reevaluation could conclude that supplemental NEPA documentation (EA or EIS) is required.	4	5	2
New Section 4(f) Use	If a new public park or historic site is identified within the LOD or if the LOD expands into an existing park or historic site, a new Section 4(f) Evaluation could be required.	2	5	2
Archaeology	If the LOD expands beyond current limits, additional archaeological studies could be required.	4	4	1
Hazardous Materials Sites	Expansion of LOD into a potentially contaminated site could require additional hazardous materials studies and possible remediation.	2	4	1
Noise Barriers	Reassessment of traffic noise analyses per updated FHWA regulations and updated SHA noise policy could result in additional noise barriers required for future phases that were not identified during project planning.	4	3	2
Section 6(f)/Program Open Space Lands	Increase in right-of-way acquisition that affects park or recreational properties acquired or developed with federal Land & Water Conservation Act funds or state Program Open Space funds could require additional mitigation in the form of parkland replacement.	5	5	3
Streams, Wetlands, Forests	Any new impacts to streams, wetlands and forests could require additional mitigation to be provided.	3	3	3
Rare, Threatened & Endangered Species	Listing of one or more new species that could potentially be impacted by the project would require additional coordination with MDNR or USFWS and could require Biological Assessment studies to be conducted.	3	3	1
Air Quality	Future phases could require quantitative air quality analysis for PM2.5.	3	1	2

## **GLOSSARY**

<b>CTP</b>	Consolidated Transportation Program
<b>P3</b>	Public Private Partnership
<b>Design Build (DB)</b>	Contractor completes final design and constructs
<b>MDOT</b>	Maryland Department of Transportation- the umbrella organization that manages every transportation mode and service within the state of Maryland.
<b>MDSHA</b>	State Highway Administration- responsible for all of Maryland's numbered non-toll roadways

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